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DISPATCH OF "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and machinery for such dispatch, and any reader desirous of arranging for copies to be delivered to an agent or correspondent overseas should place the order with us together with the necessary delivery instructions.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas, as they are stopped under the provisions of Statutory Rules & Orders, 1940, *No.* 629

Consistency in Achievement

THE outstanding transport achievement which the British railways effected in the movement of the 320,000 members of the British Expeditionary and Allied Forces rescued from Flanders has been the subject of warm praise throughout the country. A description of the task and of some of the problems involved was given in THE RAILWAY GAZETTE of June 7. The heights to which the railway organisation rose during that operation will find their place in history, and it is fitting that these landmarks in the vast effort which the companies are making should be applauded as they occur. Feats such as these capture the imagination of the public, which is largely unaware of the great speed-up and intensification of operation brought about on the railway system to meet wartime needs. The impetus at present being given to our war industries is directly reflected in railway working, which is now probably at its highest pressure so far. The smoothness with which the system is operating, notwithstanding the heavy calls made on it, the loss of some 30,000 employees to the fighting forces, and the seconding to other national work of a number of its outstanding personalities, is a tribute not only to the resilience of the organisations but also to those on whom has fallen the duty of directing the great effort.

* * * *

Mr. Herbert Morrison's Powers

At his first press conference since assuming office as Minister of Supply, Mr. Herbert Morrison gave an outline of his approach to the problem of increasing our output of essential armaments and of the use to which he would put the sweeping powers of control and coercion vested in him under the Emergency Powers (Extension) Act. He declared that he would avoid any interference for its own sake and would impose the minimum of instruction and interference on factories and works which showed by their results that they were efficiently conducted and were doing their work with determination and public spirit. He emphasised however, that, if there should be instances which showed signs of slackness, irresolution, slow starting, or muddle, he would not hesitate to use the full rigour of the powers of control which had been conferred on him. He expressed his gratification at the response to the Government appeals for harder and longer work in the munitions industries and said that already the rate of output showed the effect of the new spirit animating management and staffs alike. Mr. Morrison also stressed the necessity for widespread co-operation in the salvage scheme. It is unfortunately still true that thousands of tons of essential materials are running to waste instead of being recovered and put to good use.

* * * *

Limiting Home Consumption

Two Orders made by the Board of Trade on June 6 effect a drastic limitation of the home trade in consumer goods. The first, the Limitation of Supplies (Miscellaneous) Order, 1940, restricts supplies to retailers of a long list of articles in common use to two-thirds of those during the six months ended November 30, 1939. Supplies are to be calculated by value and not by quantity, which no doubt will result in the volume of supplies being curtailed by more than one-third. Supplies required by Government Departments, either directly or through contractors, may be made without restriction, and exports of the controlled goods will be free from restraint. The control of home consumption is exercised through the manufacturer and the wholesaler, both of whom are required to apply to the Board of Trade for registration before June 20. The list of goods affected is wide and it is estimated that in 1939 the retail sales amounted to about £250,000,000. The first

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list brought under control in April last—woven cotton, rayon, and linen goods—represented a 1939 trade of about £100,000,000 and from the beginning of next October the reduction in supplies of cotton goods available to the home market is to be three-quarters of the amount of last year's trade.

* * * *

Machinery and Plant Control

In rather a different category from that mentioned in the foregoing note falls the second Order, which is entitled the Machinery & Plant (Control) Order, 1940. This prohibits the acquisition and disposal of machinery and plant of specified classes except under Board of Trade licence, unless it is for direct delivery to an overseas market or to a Government-controlled establishment. Replacement parts are also exempt. The 16 classes of plant covered by the Order include those used by bakers, confectioners, printers, woodworkers, and scent makers. The object of both the Orders is similar; it is to set free men, money, and materials for urgent war purposes. In this connection the control of the transfer of machinery will prove especially valuable for it will result in releasing for munition production the highly skilled engineering labour and capacity which so far has been employed in catering for unessential home needs and will also effect a welcome conservation of steel and other valuable metals. In order still further to keep a grip on domestic trade, an Order came into force on June 10 bringing all goods, except certain live animals, under the operation of the import licensing system. It will remain possible to import certain essential materials under Open General Licence. An important and welcome feature of these various Orders is to be found in the fact that any sacrifice entailed will fall entirely on the home market and that the export trade will receive every encouragement to expansion.

* * * *

Overseas Railway Traffics

Improvement in Argentine railway traffics is still deferred and in the 48th and 49th weeks of the current financial year the only sign of an increase has been that of 1,100 pesos net on the Argentine North Eastern. Antofagasta traffics continue to advance and to date they are up £126,760. On the Central Uruguay the aggregate increase in sterling is £134,231 and in Uruguayan dollars $208,128, although in the 48th and 49th weeks there has been a drop of $26,210 in currency receipts. Brazilian railway traffics in sterling are up, with occasional decreases in milreis.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific* ...	49th	1,203	– 218	66,894	– 3,034
Buenos Ayres Great Southern*	49th	1,990	– 35	112,634	– 419
Buenos Ayres Western* ...	49th	647	– 113	37,793	+ 1,106
Central Argentine*	49th	1,603	– 630	84,856	– 9,000
		£	£	£	£
Canadian Pacific	22nd	854,400	+ 65,400	12,238,800	+ 1,948,000
Bombay, Baroda & Central India	9th	336,300	+ 36,525	1,816,575	+ 175,125

* Traffic returns in thousands of pesos.

Aggregate gross earnings of the Canadian Pacific Railway for the first four months of 1940 amounted to £9,536,400, an increase of £1,644,600 in comparison with the first four months of 1939, and the aggregate net earnings of £1,449,600 showed an improvement of £973,400.

* * * *

New York Central Railroad

Although operating revenues were adversely affected by a sharp reduction in tonnage of bituminous coal handled during April and May, 1939, due to labour troubles in the mining industry, there was some increase in the volume of traffic handled during the first eight months which was followed by a more substantial increase during the last four months of the year. Freight revenue, amounting to $240,130,665, showed an increase of $37,348,957 or 18·42 per cent. over 1938 and revenue freight handled was 21 per cent. greater. In the passenger revenue of $61,412.817 there was an increase of 1·82 per cent., although the number of passengers was 3·62 per cent. less.

	1938 $	1939 $
Railway operating revenues	298,681,195	341,086,708
Railway operating expenses	237,502,383	256,884,232
Net railway operating income	15,582,476	37,303,427
Income available for fixed charges	29,076,407	52,612,680
Fixed charges	49,230,764	48,103,444
Net income	Dr. 20,154,357	4,509,236

Miles in operation at the end of 1939 were 11,008, against 11,070 at the end of 1938. The operating ratio was reduced from 79·52 per cent. to 75·31 per cent.

* * * *

Nasmyth Wilson & Co. Ltd.

It is announced that Nasmyth Wilson & Co. Ltd. has made arrangements to dispose of its lands, building, and plant, together with stocks and work in progress. When the transaction is completed the company's assets will consist of book debts, investments, and cash, and a name famous in Manchester engineering will have passed from the realm of makers of fine products. The identity of the buyer has not been disclosed, but the sale now being effected will mean that the works, which are very busy, will continue to play their full part in the nation's armament drive. When Nasmyth Wilson's was first registered as a public company in 1882 the object was to carry on business as locomotive and general engineers and ironfounders. It was converted into a private company in the middle of 1908 but in August, 1919, again became a public company. It disposed of its locomotive building business early in 1938 and the present arrangements will not mean the re-entry of the plant into that field of enterprise. In recent years the company has been engaged mainly as hydraulic engineers and ironfounders. For a number of years the company, in common with many another of its kind, had suffered adversity, but more recently it had begun to come into its own again with the re-armament and then wartime demand for engineering products.

* * * *

Uniformity Sought in Canadian Rates

A general review of Canada's railway freight rate structure on a Dominion-wide scale was suggested by the Royal Commission on Dominion-Provincial Relations in its report after a brief survey of complaints placed before it. Such a review would permit the various governments to present their claims to a body qualified to make appropriate awards and make it possible to deal with rates for waterborne traffic. The commission considered the present opportune for such review because of changed conditions "due to the increased range and effectiveness of alternative means of transportation and the increasing signs of a revival of regional questioning as to the justice of the existing structure." While Ontario contended before the commission that low Western grain rates were a burden on Eastern Canada, the commission stated that the record, which it reviewed, left undecided the question of the profitability or otherwise of the grain rates. A definite finding on this point would be a contribution to the process of adjustment, it added. As to the equalisation of freight rates, it reported that its research staff conducted studies from which it concluded that "despite very special difficulties due to conditions of geography and terrain, the tendency of rate making has been and still is to lessen the regional differences and, what is also very important to keep for Canada a position of relatively low freight rates."

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Indian Signal Aspects

The official *Gazette of India* for April 13, 1940, contains approval of the use of a number of signal aspects, already provisionally sanctioned for use on certain lines, thus modifying the provisions of the General Rules issued in 1929, which in turn superseded those of 1906. The upper quadrant square ended three-position semaphore had been formally allowed in 1929, but little or no use has been made of it until quite recent years. The Assam-Bengal Railway, for instance, has now adopted it in its new double wire installations, on the recommendation of its Signal Engineer, Mr. E. W. Baker. The signal system devised by him, after much investigation into Continental practice and experiment in India, differs very considerably from previous Indian practice. The *Gazette of India* now sanctions a three-position distant signal, derived from Belgian practice, with yellow fishtail arm and showing "caution," "attention," and "proceed" aspects, with yellow, double yellow, and green lights by night, but to what extent such a signal is yet to be seen in India we have at present no information. The minimum three-aspect equipment for a Class "B" station is laid down as distant signal and outer, or outer and home.

* * * *

Driving Wheel Diameters

In earlier times locomotive engineers thought in terms of large diameter driving wheels when engines were being designed for high-speed duties, their view being that it was beneficial in every sense that the number of revolutions should be kept down as much as possible when the engines were running fast. They were prepared to use wheels as large as 8 ft. in single-driver locomotives, and there were cases in which even this dimension was exceeded, notable among them being the *Cornwall* of the former L.N.W.R. with its 8 ft. 6 in. wheels, and the Bristol and Exeter 9-ft. tanks. If speeds were high train loads were low, and the latter factor mitigated to some extent the difficulty which wheels of very large diameter bring about at starting. It is sometimes remarked that it is "speed that kills," and a locomotive of former days with small diameter coupled wheels when driven fast was inclined to be "fussy" and in some degree lacking in economy. Nevertheless, engines with relatively small wheels such as 6 ft. and even less as now built are capable of reaching speeds of 80 to 90 m.p.h. and more with heavy trains and at the same time show to advantage at starting and when climbing. Could the railway engineers of the past return to the scenes of their erstwhile activities, we may assume that one of the things which would surprise them most would be the remarkable speed abilities of small-wheeled engines.

* * * *

Track Circuits and Rusty Rails

The track circuit depends on the establishment of satisfactory contact between wheel and rail to produce the danger indication, and in this respect works in the opposite way to our other signalling circuits. In certain circumstances rails may become so rusty as to render the working uncertain, and various measures have been suggested for overcoming the difficulty. As briefly reported on page 832, the Pennsylvania Railroad has developed a method in which a copper strip is inserted into the head of the rail, with, it is said, satisfactory results. The copper oxidises very slowly and is effective for a long period on little-used turnouts and crossovers. Proposals have been made in France for a "magnetic" track circuit which would not depend on contact at all. We have seen no details of the device but understand it proved possible to work only a very short length with it.

Railway Financial Problems

WHILE the financial agreement between the railways and the Government was being negotiated, it was expected that the terms when agreed would enable the remuneration payable to the controlled undertakings to be estimated within broad limits, but recent announcements in Parliament may have caused railway stockholders some alarm. Much time was spent in hammering out the main heads of the pact and these were at last announced by the Minister of Transport on February 7. The plan which the railways had ultimately accepted left a great deal to be desired and, as has frequently been stressed in THE RAILWAY GAZETTE, had as a basis principles which were widely recognised in practical railway circles as difficult to implement fully. Nevertheless, the agreement as it stood, although not giving the railways all they had hoped for, appeared to assure them fairly reasonable remuneration for the great part they are playing in the national endeavour. The agreement left certain major problems for settlement at the conclusion of control, but it is doubtful if this could have been avoided. The arrangements are working smoothly and, to the extent of the 10 per cent. increase which came into force on May 1 last, the Government has already implemented its undertaking that the level of rates and charges shall be raised as necessary to meet the railway companies' increases in working costs arising out of war conditions. This is in distinct contrast to the arrangements during 1914-1921 when, as will be remembered, railway rates and charges were not increased in step with rising costs, with resulting dislocation of industry when the lag was overtaken towards the end of control.

Within the last few weeks the sudden and violent change in the war situation has inevitably had a profound influence on the relationship of the State with industry. In his Budget speech the Chancellor of the Exchequer announced his intention to introduce the Limitation of Dividends Bill which would have had the result, so far as the railways were concerned, of putting an upper limit of 4 per cent. on ordinary stock distributions, which is less than might have been possible on, say, G.W.R. ordinary under the agreement. The measure has now been dropped but, even if there were still no moral obligation on commercial undertakings to harbour their resources, prudence would in any event have dictated a more conservative dividend policy than would have been adopted in less uncertain times. Under the Emergency Powers Extension Act the Government took powers to control all industry; since the railways have been subject to Government control from the outbreak of war, that might not appear superficially to affect them greatly. On the other hand the powers granted the Government are so extensive that they make possible the abrogation of agreements previously entered into by the State with industrial undertakings and the establishment of an entirely new conception of the relationship between the Government and trade and commerce. There is no reason to suppose, however, that the Government does not intend to abide by the terms of its arrangement with the railways.

At first sight the further announcement that a 100 per cent. tax will be levied on the excess profits of all undertakings, retrospectively from April 1, may have given the impression that the railway agreement has been thereby rendered inoperative to a large extent, but, having regard to the provisions of Section 26 of the Finance Bill, it should not be assumed that a reasonable return on railway capital, if earned, will be ruled out by this measure. The Section provides, *inter alia*, that if the Commissioners are satisfied that the profits of the standard period "were so low that it would not be just to ascer-

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tain the standard profits of the trade or business by reference to the actual profits of the standard period, they may direct that the standard profits for a full year shall be ascertained as if the profits of the standard period were of such . . . greater amount as they think just." In this connection the adoption by the legislature of the Standard Revenue provisions in the Railways Act of 1921 gives reasonable hope that, subject to the limit of 6 per cent. on capital, the railways should not suffer by reason of Excess Profits Tax. In any event railway stockholders, than whom there is no more patriotic section of the community, would be the last to suggest that their industry should be specially exempted from taxation intended for application to the country as a whole. Recent happenings have very forcibly brought home to us the fact that legislation of a kind which would have been abhorent to a free people in times of peace is a vital necessity in order that we may withstand the Nazi onslaught, which derives its power from a harnessing of the whole of a nation's resources—both human and material—to the service of the State.

* * * *

Nationalising the Swedish Railways

UNTIL the present time, the railways of Sweden have constituted an unusual mixture of State and private ownership, based on a decision of the Riksdag in 1853 adopting the principle that the main lines should be built and operated as State railways, but that it should be left to local or private initiative to undertake minor railway projects. The first railway to be opened in Sweden—the Royal Swedish—was a British privately-owned 11-mile standard-gauge line between Arboga and Orebro brought into service on March 5, 1856, but on December 1 of the same year the first section of the State enterprise, the trunk railway from Stockholm to Gothenburg was also opened. The latter was extended year by year until the whole 283 miles between Gothenburg and Stockholm was completed on November 8, 1862. Two years later another State railway line, between Malmö and Falköping, connected the province of Skåne with Stockholm over this trunk line. After a period of depression in the late sixties, a hectic railway-building era set in during the seventies, mostly as the result of private initiative, and with the aid of British capital.

At the present time, the only Swedish railways outside State control which may be considered main lines for through traffic are the Bergslagen Railways, connecting Gothenburg with Dalecarlia by way of Kil and the Bergslagen mining and ironworks district, and the Gävle-Dala Railway, connecting the port of Gävle with the same district. These two railways form a main line between the west and east coasts of Sweden, and jointly with another privately-owned railway, the Stockholm-Västeras-Bergslagen Railway, also provide a through route between Gothenburg and Stockholm alternative to the direct line of the State Railways. With the Dalsland Railway, from Mellerud to the Norwegian frontier at Kornsjö, the Bergslagen Railways provide the through route northward of Gothenberg from Copenhagen and Malmö to Oslo. The mileage of the State Railways is now about 5,000 miles, and of privately-owned railways about 5,500 miles of which 2,400 miles are narrow-gauge. Sweden has a larger mileage of railways *per capita* than any European country, 16 miles per 10,000, as compared with about 6 miles per 10,000 in Germany, which is due to the long distances and sparse population. The traffic intensity is in consequence rather low, and, on account of the long coastline and many internal waterways, the traffic figures for goods are lower than would otherwise be the case. The four north-south trunk lines operated by the State, are the Western Main Line (Stockholm—Gothenburg); the Eastern Main Line (Stockholm—Malmö); the West Coast Line (Gothenburg—Malmö); and the Northern Main Line (Stockholm—Lapland—Finnish frontier). All these are electrically worked except for 413 miles of the last named, which is programmed for conversion. The recently-completed Inland Line (Kristinchamn—Ostersund—Gällivare) has strategic rather than traffic importance. The most important east-west State main lines are those connecting the Swedish and Norwegian railway systems by way of Storlien (for Trondheim) and Charlottenberg (for Oslo).

For some years past the State Railways have taken over, more or less compulsorily, certain company-owned railways, and the present policy is to nationalise all privately-owned lines within the next five years. This decision in principle to amalgamate all the private railways in Sweden with the State Railways system, successively and by voluntary agreements with the railway companies, was taken by the Riksdag last year, and the undertakings of several railway companies have since been acquired, as we have recorded from time to time in our news columns. There has been considerable opposition within and outside the Riksdag to this State purchase in the present situation, as it is considered that owing to the heavy national defence requirements great economy should be observed in other spheres of public finance, and also because some disturbance of the money market by the possible selling of the Government bonds received as payment was feared. The Minister of Communications has emphasised, however, that he considers the 1939 decision should be put into execution, although he does not urge that the quinquennial programme, originally established, should be maintained. If a slower execution of the decision was thought more suitable, it might be chosen. The budget committee, recommending the proposal for continued purchases, accentuated among other things the importance of greater Government control of the railways. Individual members of the Riksdag also pointed out the need of renewing the rolling stock, for which some railway companies lacked the necessary capital, and others the consequences for the communications of the necessity of saving petrol, and the greater demands which the supply of provisions to the population put on the railways. Accordingly, the Riksdag has just sanctioned the further expenditure of Kr. 20,616,000 for the Government purchase of a total of 533 miles of private railway in southern Sweden. The ten lines concerned are detailed in our Overseas columns, at page 829.

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Swiss Federal Railways in 1939

THE Swiss Federal Railways own 2,903 km. of line and under arrangements with other administrations work portions of adjacent frontier lines. Of the railways owned, some 2,175 km. are now electrified, including all the main lines. The year 1939 was notable in that the railways secured, for the first time since 1930, a net profit over and above working expenses and financial charges. This profit amounted to fr. 7,478,152, and compares with a deficit of fr. 35,238,051 for the previous year. In the actual traffic receipts of fr. 347,807,318 there was an increase of fr. 40,184,324, but sundry receipts from properties, auxiliary services, etc., amounting to fr. 13,361,522, showed a diminution of fr. 2,156,484. It was the goods traffic that provided the bulk of the increase in traffic receipts in comparison with 1938. Passengers increased in number by 5·2 per cent., but passenger receipts by only 1·3 per cent. This was because of the large numbers of passengers making use of cheap tickets to the National Exhibition at Zurich from May 6 to Octo-

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ber 29, also because of military traffic on mobilisation, and of the heavy reduction in foreign tourist travel on account of the international situation. In goods traffic there was an advance of 23·1 per cent. in tonnage and of 21·9 per cent. in receipts compared with 1938. The revival in business which was steadily progressive until September, brought an improvement in internal traffic but the bulk of the increase in consignments came after the outbreak of war. There was naturally an increase in transit traffic in comparison with 1938 but this traffic represented only fr. 3·9 millions out of the total increase in goods receipts. Other causes for the heavier goods traffic by rail were the military traffic, and the diversion of road traffic because of petrol restrictions and the requisition of motor vehicles. The accompanying table compares results in the past two years. At present the rate of exchange is about fr. 17·90 to the £.

	1938	1939
Passengers	113·20 millions	119·12 millions
Goods traffic, tons	13·87 millions	17·07 millions
Train-kilometres	46·6 millions	46·36 millions
Operating ratio, per cent. ...	71·02	61·96
	Fr.	Fr.
Passenger receipts	131,906,116	133,639,884
Goods and postal receipts ...	175,716,878	214,167,433
Gross receipts	323,141,000	361,168,840
Expenses	229,484,644	223,895,145
Net receipts	93,656,356	137,273,695

The operating ratio in 1939 was the lowest in the history of the Federal Railways. Electrification, which makes the railways to such a large extent independent of rising coal prices and requires less personnel for operation, other measures of rationalisation, reduction in staff expenses, and economies in the use of materials have assisted in this saving. At the end of 1939 the regular operating staff numbered 27,328, a reduction of 303 on the total at the end of 1938. This reduction in working expenses is the more remarkable in that it was effected during a year when traffic was exceptionally heavy. It shows the importance of the railways in the national economy, as with their immense carrying capacity they can convey a large additional traffic without an overall increase in expenditure. Passenger train-kilometres were 34·8 millions, a decrease of 670,000, whereas goods train-kilometres increased by 426,000 to 11·56 millions. During the year an electric main-line locomotive, two diesel-electric locomotives, a high-speed double electric railcar, and seven electric tractors were put into service on the standard-gauge lines. Orders have been placed for four main-line electric locomotives, seven electric shunting locomotives, 25 electric tractors, 330 covered wagons, 500 open wagons, and other rolling stock for standard-gauge lines, and an electric tractor for the Brünig narrow-gauge line. Credits to the amount of fr. 8,950,000 have been passed for the electrification of the Brünig line. During the year 15 level crossings were abolished. The double line between Emmenbrücke and Sentimatt was brought into use on June 6, 1939.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A State of Agitation

Essex House, W.C.2
June 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I find the following passage in the "General History of Inland Navigation" by J. Phillips, 4th Edition (1803) at page 594 :—

"1802.—The locks, canal, and basin, from which the Surry iron rail-way, now in agitation, is to commence at Wandsworth, have been lately opened, and the water admitted from the Thames. The first barge entered the lock amidst a vast number of spectators, who rejoiced at the completion of this part of the important and useful work. The ground is laid out for the rail-way, with some few intervals, all the way to Croydon; and the undertakers are ready to lay down the iron; it is expected to be completed by Midsummer."

Yours faithfully,
KENNETH BROWN

[According to "The Cyclopædia" by Abraham Rees, Vol. VI (1819), the basin at Wandsworth was opened on January 9, 1802, and "in October of the same year, the railway from the side thereof crossing the turnpike road, and extending to Garrat was completed."—ED., *R.G.*]

PUBLICATIONS RECEIVED

Railway Posters and the War, No. 4. London: THE RAILWAY GAZETTE, 33, Tothill Street, S.W.1. 7¼ in. × 5 in. Price 6d. net.—The posters issued by the Railway Executive Committee and the railway companies have been reproduced in the series of articles entitled "Transport Services and the War," which appears weekly in THE RAILWAY GAZETTE, and afterwards reprinted in booklet form. Since number 3 of this series of booklets was compiled, the requirements of train service adjustments as a result of the abnormal winter weather at the beginning of the year brought forth a number of posters of both the "goodwill" and announcement type. There followed a period during which "prestige" and "anti-gossip" posters predominated, but the decision to increase fares and charges by 10 per cent. from May 1 brought about a revival of displayed announcements. In view of the speedy development of the war in recent weeks, it is probable that British railway posters will be confined largely to this type, more especially as the Government has banned non-essential posters as from May 27.

A Railway Library.—Under the title of "Railways," the firm of David Low Booksellers Limited has recently produced Catalogue 33 listing over 300 items of outstanding interest. Many of these came from the collection of the late Mr. W. B. Worthington, Engineer-in-Chief, Midland Railway, whose death on December 29, 1939, was recorded in our issue of January 5, 1940. This remarkably fine collection was auctioned recently and contains some unique items and others which seldom come into the secondhand book market. This catalogue also includes items from the libraries of Sir Edward Watkin, Frederic Swanwick, G. A. Sekon, and S. B. Worthington. The catalogue descriptions are clear and informative and achieve a high degree of accuracy. We understand that its compilation was undertaken by Mr. R. E. Waterfield, one of the Directors of David Low Booksellers Limited, 17, Cecil Court, Charing Cross Road, W.C.2. Copies are obtainable free of charge.

Pneumatic Tools.—The recently-issued new edition catalogue No. 50 of the Consolidated Pneumatic Tool Co. Ltd. does further credit to the already high standard of this concern's trade literature. It is a comprehensive fully-illustrated production measuring 11 in. by 8½ in. and covers the entire range of pneumatic tools and associated products manufactured and supplied by the company. The subject matter is divided into nine sections and a thumb index assists in finding the section required with the minimum of trouble. An index of sections is provided and the articles listed in each of these are alphabetically arranged, thus adding to the convenience of users of the catalogue. Numerous large-sized illustrations of ship and bridge work in the erection of which Consolidated pneumatic tools have been used form an attractive feature of the catalogue, and there is a considerable amount of tabulated data respecting the capacity, sizes, and other particulars of the tools.

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THE SCRAP HEAP

Of the 85,562 on the payroll of the London Passenger Transport Board, 12,419 have joined the first staff cycle (financial period) for the purchase of National War Savings Certificates; this is 14 per cent. During the first cycle, London Transport staff has ordered 68,674 certificates. Members for the second cycle must enrol by June 20.

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LORD ASHFIELD TELLS THIS ONE

Years ago in America when I was thinking "How marvellous it is to be a general manager," a permanent way ganger, an Irishman, asked me for a job for his boy.

I said, "What *sort* of a job, Pat?" and he replied, "Me and my missus have been talking about it, and the boy's had some education and we think perhaps you might start him as office boy and one day he might be a clerk and then secretary of the company, and (you don't know) he might be general manager same as you are."

"Pat," I said, "put him on a gang, start him carrying water for the men, and then one day he may strike a rail and wind up by being a foreman such as *you* are."

Pat replied, "Me and my missus have talked about that too, *but the boy isn't so darned smart!*"—*From "Pennyfare."*

* * *

Fewer persons lost their lives in railway accidents in the U.S.A. during 1939 than in any previous year since the Interstate Commerce Commission began the compilation of reports, in 1888.

On Monday last the luggage train on the London & Birmingham Railway passed Leighton Buzzard station with the extraordinary number of 87 carriages, drawn by four engines.—*From the "Northampton Herald" of October* 10, 1840.

* * *

A correspondent tells us that he possesses a copy of a plan, on the scale of 1 in. to a mile, entitled :—

A plan and section of an intended railway or tramroad from Liverpool to Manchester, in the county palatine of Lancaster, surveyed by George Stephenson, engineer, 20th November, 1824.

The Liverpool terminus, as marked on this plan, was to have been near the Prince's Dock ; and the Manchester terminus in Quay Street. Had this plan been adopted, the Liverpool & Manchester Railway would have begun at the north end of Liverpool, and, running parallel to the Leeds & Liverpool Canal, would have continued in that direction until about half a mile beyond Walton, when it would have diverged inland, and so on to Manchester.

* * *

The following is culled from the *Stockport Advertiser* of June 20, 1850 :—"Last Monday a man was sent by his employer with a basket of clothes to the Stockport station, to be forwarded to a laundress at Cheadle Hulme, with orders to pay the carriage. The basket and clothes being accordingly weighed, the carriage was announced to be 2s. 4d., nothing less. The man refused to pay it, but purchasing a third class ticket, he took the basket and clothes as his luggage, and came back by the next train, thus paying 5½d. for his two rides, and saving his employer 1s. 10½d."

* * *

The Minister of Aircraft Production announces that the *Gleaner* newspaper of Jamaica has sent him £20,000 to buy a bomber. The money has been diverted to the purchase of the biggest and best bomber so far produced. This aircraft has been named the *Jamaica*. In acknowledging this splendid act of generosity, the Minister has presented his grateful thanks to the *Gleaner* and to the people of Jamaica who have contributed so magnificently to the fund.

* * *

THE FIRST RAILWAY BRIDGE ACROSS THE THAMES

The works of the railway bridge across the Thames at Chelsea, the only railway bridge over the Thames in London granted, are in rapid progress. By the time it is constructed the Pimlico railway and station will be finished, and Belgrave Square will be within sound of the railway whistle, giving its aristocratic inhabitants convenient and first class railway conveyance to Brighton, Hastings, Portsmouth, the Crystal Palace, etc.—*From "Herapath's Railway Journal" of March* 5, 1859.

* * *

A correspondent wrote in *The Manchester Guardian* of September 3, 1840, that a friend of his travelled in one of the "stand-up" carriages on the Manchester & Leeds Railway, in company with two respectable, well-dressed females, several mechanics, and *two pigs*. The editorial comment was that, if people travelled in the lowest class of carriages, they had no right to be particularly squeamish as to their fellow travellers.

Above: The railway booking office at Wootton Rivers, near Marlborough, situated 10 min. walk from the station, is in the yard of the Royal Oak, an ancient village inn

Right: Booking office at the Miners' Arms, Farrington Gurney, Somerset. The landlord's wife holds the dual position of clerk and barmaid

Unusual G.W.R. booking offices

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

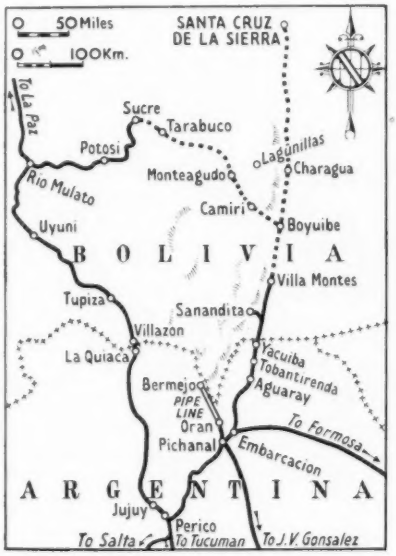
Argentine—Bolivian Railway Construction

An important commercial agreement, to be followed by a formal treaty, has been signed between the Argentine and Bolivian Governments, providing, amongst other things, for the construction of a railway between Santa Cruz de la Sierra, Bolivia, and the town of Yacuiba on the Argentine—Bolivian frontier, with a branch line to Sucre, Bolivia. In thus establishing a direct connection with the Central North Argentine (State) Railway, these new lines will assist in the development of the Bolivian oilfields and stimulate petroleum and mineral traffic over the Argentine railways. Santa Cruz de la Sierra is situated about 300 miles south-east of La Paz, the commercial capital of Bolivia, and about the same distance due north of Yacuiba, the southern terminus of the proposed line.

By the terms of the agreement the Argentine Government undertakes to advance the necessary funds to the Bolivian Government for the construction of the first section of the Yacuiba—Santa Cruz line, namely, from the Argentine—Bolivian frontier to Villa Montes, approximately 64 miles, the work to be started within two months of the agreement becoming effective. As soon as the treaty is approved, the Bolivian Government shall call for public tenders for the construction of the first section, the work on which is to be pushed on as rapidly as possible so that it may be completed within a year. The cost of this first section is estimated at $10,000,000 Argentine paper.

On the completion of the first section, the Bolivian Government agrees to deliver to the Argentine Government the quantity of fuel oil and crude petroleum necessary to cover the funds advanced, the price, proportion of each product, and rates of interest and amortisation to be fixed by mutual agreement. The Argentine Government also undertakes to construct a pipe line to connect the oilfields at Bermejo, just in Bolivian territory, with those at Oran, near Embarcacion in Argentina.

If the output of the Bolivian oilfields proves sufficient to justify the construction of the other sections, the railway will be extended as far as Santa Cruz de la Sierra and Sucre. The railway is to be operated exclusively by the Bolivian Government.



Sketch map showing the proposed new railways on the Argentine—Bolivian frontier

Improved Customs Facilities

Under another section of the foregoing international agreement, the Customs regulations for the examination of the luggage of transcontinental railway passengers between Buenos Aires and La Paz have been revised. In future the luggage of such travellers will not, as heretofore, be examined at the frontier, but on arrival at one or other of the termini mentioned. The luggage will, however, be conveyed in a locked and sealed van, and passengers will be required to hand a declaration of the contents of their luggage to the guard, to be delivered to the Customs officials at Buenos Aires or La Paz.

CANADA

New Montreal Terminal and South Approach

Despite the war, Canadian National Railways engineers are going ahead with the new Montreal terminal, and this summer should see the modified scheme well on the way to completion, with more work on the track layout, the erection of the Lachine Canal and Smith Street bridges, and the preliminaries for the new station building, the only four items in the modified scheme still to be done. Its completion will allow trains from the west, or from New York, to run into the new platforms stretching from Dorchester Street down almost to St. Antoine Street. [See plan on page 632 in our issue of May 3 last.—ED., *R.G.*] Drillers, blasters, and shovellers are removing the rock from the old station area, so that it can be brought down to the new level, and for the laying of the additional tracks and platforms. Four tracks are already in use. The new layout will link up with the twin lines emerging from the tunnel, enabling other platforms to be brought into use as the demand increases. A considerable quantity of work remains to be done below Lagauchetiere Street bridge, but progress here is rapid.

The new station building will be opposite the end of Belmont Street, access being obtained from four directions, and there will be individual ramps to each platform. Baggage will be carried below the platforms leaving them clear for passengers. When the new station is built the old Lagauchetiere Street edifice will be demolished, as it is in the way of further development of the track layout.

The contract for the steel of the big span, which will carry the line diagonally across the corner of Smith and Ann Streets, should be let shortly and, with the approaches nearing completion, the viaduct will be brought right down to the banks of the canal. The Lachine Canal bridge will be of the double-lift type, a new departure for Montreal where all bridges over the canal were swing spans until the bascule one was built at Ville St. Pierre, 20 years ago. This double-lift bridge will operate from the extension of the already existing island in the middle of the canal, upon which rested the old Wellington bridge and the low-level Canadian National Railways structure. Towers on each bank and upon the island will allow the operator to hoist the requisite half of the bridge high up in the air when required for navigation purposes.

INDIA

Nizam's State Railway Progress

On April 1, 1930, the Nizam's Government acquired the railways within the State, so long worked by a private company under a guarantee from the Government. The ten years of State management completed on March 31, 1940, has witnessed remarkable progress, including the opening of 122 miles of new railway and the placing under construction of a further 100 miles. The Nizam's Government inaugurated road transport services under the Railway Department, and 4,082 miles of road are now being operated by the State Railway Road Transport Section with an up-to-date fleet of buses and lorries totalling 300 vehicles. Air transport has also been developed in the State and adequate local personnel has been trained in the operation and maintenance of aircraft. An aerodrome has been built and equipped with all modern facilities, and commercial air services are being initiated.

The decade closes with a record year of gross and net earnings and tonnage carried. The financial benefit to the State from the acquisition can be gauged from the fact that the Railway Department has contributed to the State exchequer Rs. 10 crores in these ten years without neglecting to make adequate provision for depreciation. Some 100,000,000 passengers and 25,000,000 tons of goods have been carried over the railway system averaging 270,000 passengers and

XUM

3,000,000 tons of goods hauled over every mile of the railway. The total gross weight that has passed over the railway during the ten years amounts to 15,740,000,000 tons or a gross weight of 12,000,000 tons for each mile of railway. The number of passengers carried by the road transport service of the State since its inauguration in 1932 is about 63,000,000.

The Record for 1939-40

Gross earnings during 1939-40 amounted to Rs. 284 lakhs and working expenses to Rs. 152 lakhs, resulting in net earnings of Rs. 132 lakhs, as against Rs. 271 lakhs, Rs. 148 lakhs and Rs. 123 lakhs, respectively, in 1938-39. The substantial rise of Rs. 13 lakhs in gross earnings was due to good crops and favourable demand. A saving of 16 lakhs in working expenses, in spite of an increased volume of traffic, speaks eloquently of administrative efficiency.

Four new broad-gauge air-conditioned diesel railcars will shortly be put into service. The mileage operated by the Road Transport Service was slightly in excess of the figures for the previous year. The gross earnings increased by about Rs. 85,000, but there was a substantial drop amounting to Rs. 2·25 lakhs in working expenses.

Frontier Mail Collision

The B.B. & C.I.R. Frontier Mail from Bombay to Delhi collided with the engine of a goods train near Jekot station on the morning of May 15, and, as a result, 18 persons were killed and 17 were injured. Of the injured, three subsequently died. Official details of the accident are not yet available. It is gathered, however, that the goods engine was on the main line and was being shunted into a loop line when the crash occurred. The driver of the Frontier Mail noticed the obstruction only after his engine had taken a curve, and, although he applied the brakes immediately, the train could not be brought to a standstill before the impact. The goods engine was badly damaged and, it is reported, the first three bogie carriages of the seven forming the mail train were smashed. The first was an intermediate class coach, the second a composite first and second class, and the third an air-conditioned coach carrying passengers to Peshawar. The General Manager and the Senior Government Inspector of Railways arrived on the scene of the accident without delay. The line was cleared within 24 hours. [This accident was briefly reported on page 754 in our issue of May 24.—ED., *R.G.*]

Locomotive Industry in India

There has just been concluded in Simla a series of discussions initiated by the Railway Board to ascertain expert opinion in connection with the manufacture of locomotives in India. It is understood that the Chief Mechanical Engineers of three railways were summoned to confer with the board and with Messrs. Humphries and Srinivasan, the authors of the recent report on the construction of locomotives in State Railway workshops. As a result of these conferences, it is believed that the scheme to build broad-gauge locomotives at Kanchrapara on the Eastern Bengal Railway will be adopted, in accordance with the recommendation of the special committee.

Plans are going forward on the basis of an initial output of 100 locomotives per annum, which represents the normal requirements of the Indian railways for some years to come. The installation of the plant is expected to take two years, which is only slightly longer than the time taken in normal conditions. In view of the difficulty of importing the plant either from the Continent owing to the war, or from America owing to the rise in the dollar exchange, British machinery is likely to be ordered. It is believed that the full scheme will be ready in time to be placed before the Standing Finance Committee for Railways about the end of June, but if this is not possible, a special meeting of the committee may be called later to examine and sanction the project.

WESTERN AUSTRALIA

Private Sidings Charges

Before 1935, owners of private sidings connected to the Western Australian Government Railways were charged rents of £20-£35 a year for right of access to the main line, plus actual costs incurred in maintenance. At the end of 1934, however, with a view to encouraging the connection of further sidings, and to give some relief to existing siding holders, the right of access charge was reduced to a flat rate of £10 per annum, and arrangements were made for maintenance costs to be averaged, a set annual charge being based on estimated maintenance over the life of the siding. Under this arrangement the siding-holder has the advantage of knowing his yearly liability for maintenance, and the amount is collected in quarterly instalments at the same time as the fee for the right of access. The new arrangement was for a trial period of five years, beginning on January 1, 1935. This term having expired, investigations have revealed that the new basis of charging has worked satisfactorily, and it has therefore been decided to make it permanent.

Southern Cross—Yellowdine Improvements

A work of some magnitude now nearing completion is the deviation and regrading to a 1 in 100 ruling grade in the down direction on the Southern Cross—Yellowdine section of the main eastern goldfields line. This work, which followed similar improvements between Merredin and Southern Cross, was put in hand largely for the relief of unemployment. The work entailed the construction of two deviations totalling 5 miles 17 ch. and regrading of line *in situ* for a distance of 2 miles 7 ch. To avoid long hours for train crews due to the additional mileage occasioned by the deviations, the locomotive depot has been moved from Karalee to Yellowdine, a point 12 miles closer to Merredin. The section beyond Yellowdine at the eastern end has accordingly been lengthened, but as the work on this section is lighter than between Merredin and Yellowdine, no inconvenience or long hours for train crews will result. The shifting of the depot has necessitated the provision of additional sidings, an engine turning triangle, station buildings, trainmen's barracks and houses for station staff. The approximate cost of the work is about £48,000.

SOUTH AFRICA

Capital and Betterment Expenditure, 1940-41

The estimated expenditure on capital and betterment works for the year 1940-41 is £12,842,475, a decrease of £607,083 as compared with the previous year. Of this amount, £8,271,548 will be chargeable to Loan and Betterment Funds and £4,570,927 to Renewals Fund and working votes. The allocation of this expenditure is as follows:—

FROM LOAN AND BETTERMENT FUNDS

	£
Construction of railways	204,569
New works on open lines	5,647,477
Rolling stock	853,908
Road motor services	17,565
Harbours	1,046,391
Airways	285,420
Working capital	16,218
Unforeseen works	200,000
	£8,271,548

FROM RENEWALS FUND AND WORKING VOTES

New works on open lines	2,734,510
Rolling stock	958,956
Road motor services	164,628
Harbours	52,613
Airways	660,220
	£4,570,927

UNITED STATES

A New Type of Caboose

During 1939 the Chicago, Milwaukee, St. Paul & Pacific Railroad built, in its own shops, 75 new cabooses to accommodate spare train crews. Their design embodies several improvements over earlier types, including additional comforts and conveniences, as well as better external and brighter internal appearance. Instead of the standard observation cupola, there are side bay windows giving a seated man ample vision fore, aft, and abeam. In addition to being frequently masked by higher vehicles, the cupola entails many structural difficulties and its ventilation is almost unavoidably excessive.

The new vehicles are 35 ft. 3 in. long over headstocks and 8 ft. 0 in. wide, but the bay windows project a further 1 ft. 0 in. on each side; the tare weight is 19½ tons, and they have two four-wheeled bogies. All-welded construction is used, but there is ample insulation. Equipment includes a stove, lockers, toilet facilities, two reversible observation seats, sink, ice-box, and comfortable seating.

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SWITZERLAND

Assistance for Private Transport Companies

By a recent decision of the Federal Council, assistance may be granted by the Confederation and the Cantons concerned to private railways and navigation companies whose receipts, as a consequence of the war, do not cover their working expenses, in order to enable them to maintain their services or avoid a financial crisis. This will apply only to companies whose routes are of national economic or strategic importance, and not to purely local lines.

SPAIN

Rolling Stock Construction

The Minister of Public Works visited, on May 25, the works of La Maquinista Terrestre y Maritima, in Barcelona, where he inspected the work on the extensions now being constructed by the company for the immediate carrying out of large contracts for new rolling stock, so urgently required on the Spanish railways. The Minister was accompanied by the Director General of the Railway Department and made certain indications for the acceleration of production of the new vehicles.

Guadarrama Railway to Reopen

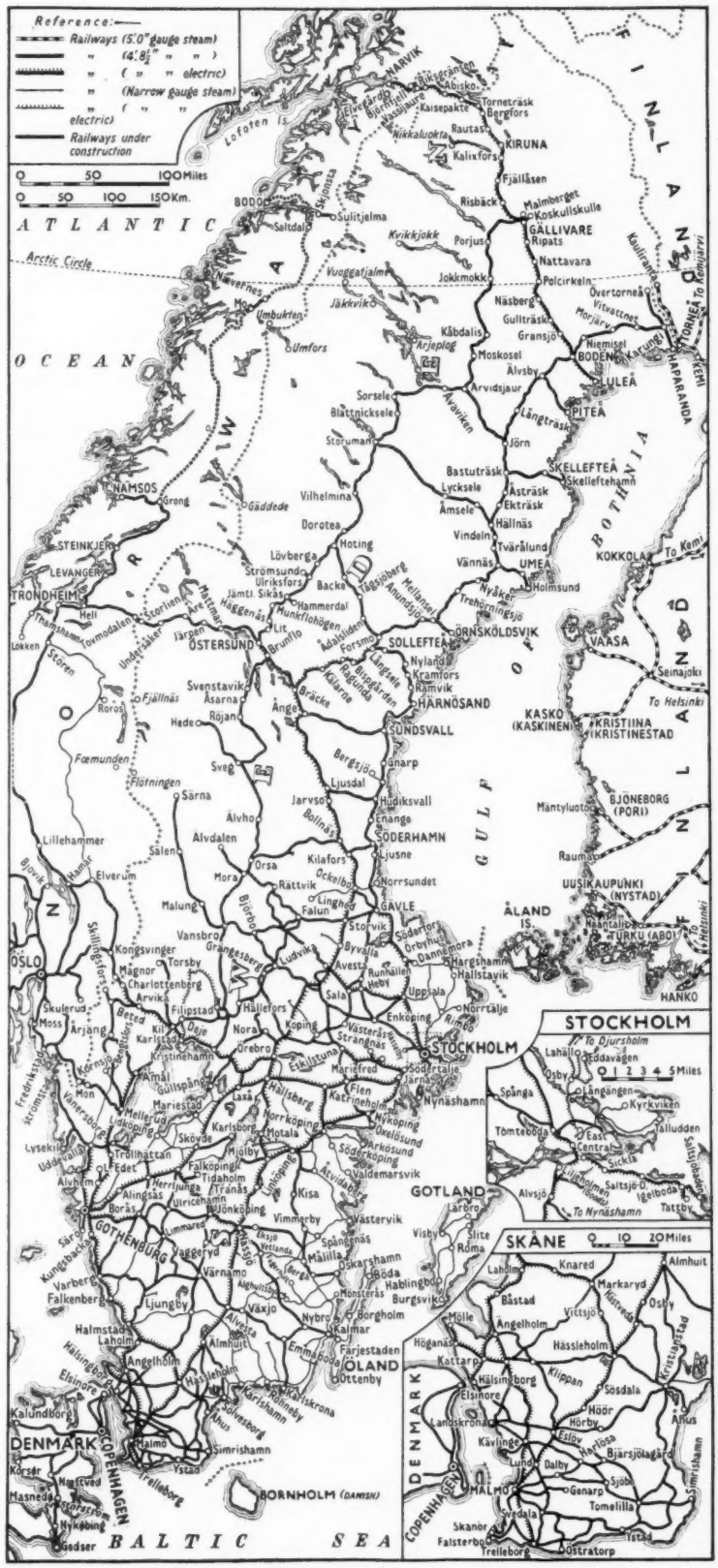
The electric railway into the Guadarrama mountains north of Madrid, the operation of which was suspended during the civil war, is shortly to resume working. The line, which is about 12 km. (7½ miles) in length, runs from the Cercedilla station of the Northern of Spain main line, 58 km. (36 miles) from Madrid, up into the Guadarrama. The trains run in connection with those of the Northern Company and are used largely by devotees of winter sports, which are possible for the greater part of the year. Cercedilla itself is 3,700 ft. above sea level, and the electric railway ascends a spur of the Siete Picos to the Puerto de Navacerrada, altitude 5,835 ft.

SWEDEN

Government Purchase of Private Railways

The Riksdag has granted an allowance of Kr. 20,616,000 for the Government purchase of further private railways, which will be absorbed into the State Railway system. The decision refers to the following railways (in southern Sweden): Gothenburg—Borås (72 km.); Borås—Alvesta (149 km.); Borås—Varberg (84 km.); Borås—Herrljunga (43 km.); Uddevalla—Vänersborg—Herrljunga (92 km.); Uddevalla—Bengtsfors (89 km.); Falkenberg—Limmared (102 km.); Kalmar—Berga (77 km.); Oskarshamn—Alghultsby (80 km.); Mönsterås—Fagerhult (70 km.). The route mileage of these lines totals 858 km. (533 miles).

[Railway nationalisation in Sweden forms the subject of an editorial article on page 824.—ED., *R.G.*]



The railways of Sweden

CAUSES OF WELDED BRIDGE FAILURES

Recent experience in Belgium and Germany

SINCE the collapse of the Hasselt bridge two years ago, the official report by the Belgian authorities has been eagerly awaited. The latest information, however, tends to show that there is no immediate prospect of such report being made available. It is the more gratifying, therefore, that in the meantime a committee of the Institute of Welding, London, has carried out extensive tests with fragments brought over to England from the Hasselt bridge. The report recently published[1] may be considered to be the first precise information on the probable causes of the accident.

It will be recalled from a previous article, based on personal observations on the spot,[2] that the initial crack was suspected to have occurred in the bottom chord of the bridge, details of which were reproduced in a short note.[3] The importance of test results with parent metal and welded joints from the collapsed bridge is further emphasised by two more failures with welded bridges in January last during the extremely cold weather, particulars of which have also been given.[4] Table I gives details of the three welded bridges in Belgium which have failed.

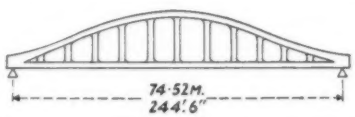
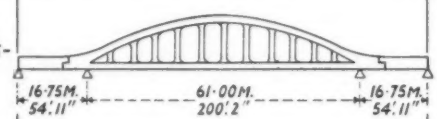
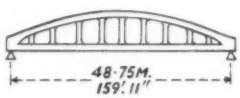
№	PLACE	TYPE OF BRIDGE	CLASS	CENTRE SPAN METRES / FEET	WIDTH METRES / FEET	BOTTOM CHORD	STEEL TONNAGE t	DATE OF ERECTION	DATE OF ACCIDENT	REMARK
1	HASSELT		LIGHT RAILWAY AND ROAD	74·52 / 244'6"	14·34 / 47'0"	WELDED	646	1935/36	MARCH 14, 1938	2 COMPLETE EXPANSION JOINTS IN BRIDGE DECK
2	HERENTHALS-OOLEN		,,	61·00 / 200'2"	9·50 / 31'2"	WELDED	395	1936/37	JAN. 19, 1940	,,
3	KAULILLE		ROAD	48·75 / 159'11"	9·00 / 29'6"	GREY BEAM ROLLED	180	1934/35	JAN. 25, 1940	,,

Table I—Details of three welded bridges over Albert Canal in Belgium which failed

The tests carried out in this country included the examination of the parent metal by chemical analysis, metallographic examination, and mechanical tests, the last comprising tensile tests, Izod tests on notched bars, and tests after strain ageing by pulling the specimens to the extent of 15 per cent. followed by ageing at 250° C. for half an hour, and by other artificial treatment. The examination of the welds included again the chemical analysis, tensile and notched bar tests, hardness measurements, etc. Altogether six fragments of the Hasselt bridge have been tested in various ways. Only one of these fragments is to be dealt with in these notes because it is that to which particular importance must be attached in view of the cause of the initial crack. We reproduce in Fig. 1 details of the joint and position of the crack in the lower chord of the bridge, showing the way in which the curved corner pieces of the verticals were joined to the chords of the bridge. The same type of joint is repeated four times at each vertical post, and this fact shows that any weakness in this joint repeats itself nearly 100 times over the bridge.

The actual fragment tested by the Institute of Welding is shown in Fig. 2. It is not known which part of the bridge it came from but it may be assumed that properties both of the steel and the welds may be typical of all similar joints. In this case the thickness of flange was 55 mm. ($2\frac{3}{16}$ in.). It is always a matter of concern at the rolling mills to obtain uniform properties of plates of such thickness. Tensile tests with a specimen cut from the portion marked A 4 gave the results contained in Table II. While the minimum tensile strength with this and other specimens was throughout in accordance with the Belgian

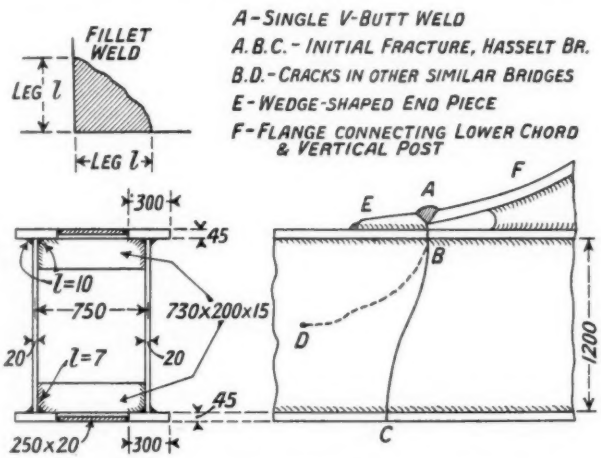


Fig. 1—Details of joint and position of crack in lower chord of Hasselt bridge, ascertained after salvage

specification (St. 42 with 42 kg. per sq. mm., equivalent to 26·67 tons per sq. in.). Elongation and reduction of area appear to have been rather irregular in their values, but within the limits. The yield point, however, is much lower than it should be. Its proportion as compared with the breaking stress is in the neighbourhood of 50 per cent. instead of two-thirds or more as it ought to be. It

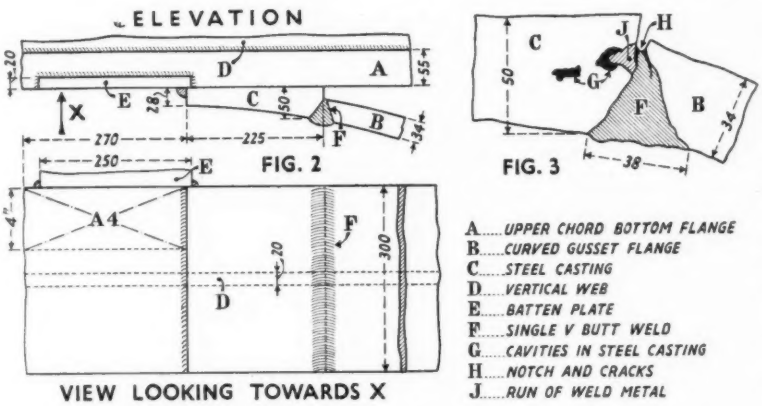


Fig. 2—Fragment of Hasselt bridge tested by Institute of Welding; and Fig. 3, macro-structure of joint F in Fig. 2

should be noted that the yield point ascertained from micro-tensile tests on all-weld metal specimens was very much better than that of the parent metal. These figures, for purposes of comparison, have been included in Table II.

Description	Breaking stress t./sq. in.	Yield point t./sq. in.	Elong. Per cent.	Reduction of area Per cent.	Remarks
Parent Metal—					
55 mm. Flange ...	30·2	14·6	23	24·9	Elongation in 4 in.
20 mm. Plates ...	28·0	15·8	30	52	" "
Weld metal from V-Weld	32·5	26·5	26	62	Fine fracture, cup and cone

Table II—Tensile tests on fragments from Hasselt Bridge

A point of concern is the steel casting forming the joint between the 34 mm. curved flange and the 55 mm. horizontal flange. Both sulphur and phosphorus contents, 0·095 per cent. and 0·084 per cent. respectively, are considerably higher than the limit of 0·06 per cent. laid down by B.S.S. No. 15. The report states that these contents are much too high to be suitable for fusion welding. Izod tests on notched bars of weld metal gave satisfactory results. Values were near or above the 30 ft.-lb. as laid down in B.S.S. No. 538 (Specification for Metal Arc Welding as Applied to Steel Structures). The parent metal of the 55 mm. flanges proved, however, to be unsatisfactory in this respect, giving average values of only 14 ft.-lb. at the rim and only 9 ft.-lb. at the core.

Apart from these weaknesses, the welding itself was considerably at fault, at least so far as this type of connection is concerned. Fig. 3 reproduces the macro-structure of this joint. There are cavities in the steel casting, and it was found that part of the cavity adjacent to the joint had been closed with a single run of weld metal before making the final vee butt weld. In addition, the root of the vee weld shows lack of fusion at both faces, and cracks developed from the root into the weld.

While there were thus weaknesses in the properties of the steel and in the welding, there still remains the basic fault in the design of this joint. No vee butt weld should be expected to transmit stresses if no sealing run can be provided at its root. In this case, the vee joint was of vital importance and the designer should have had no doubt that these joints were all situated at points where a critical ratio prevailed between bending moment and available section modulus. It is fundamentally wrong to provide this type of joint at such a position, excluding the possibility of an efficient sealing run, and to make this worse, to use a steel casting of unsuitable analysis. The fact that considerable internal stresses have been in existence in some of these bridges has been known for some time.[5] It is stated that when cutting the curved flange adjacent to the vee butt weld (see Fig. 1), a gap of 2 mm. could be measured, such deformation resulting from about 10 kg. per sq. mm. (6·35 tons per sq. in.) tension stress at this particular point.

Site welding of this vee butt weld was done under conditions of restraint, all the other welded joints having been closed before. The figure given for the locked-up stresses is not surprising; this value was found in other cases[6] to be equivalent to about 12·7 tons per sq. in., *i.e.*, well beyond the permissible stress in structural steel. Fortunately, it was found that these stresses are not so dangerous as they may look at first sight, and that redistribution of stresses will take place, provided that the material has the necessary plastic reserve. Unfortunately, very little, if any, reserve was available for local overstressing with certain parts of the Hasselt bridge.

With regard to the responsibility of cold weather for recent failures of Belgian bridges, it should be noted that notched bars, both of welded and unwelded specimens, have shown sensitiveness to low temperatures.[7] According to Professor Haigh, "all mild steels in different degrees tend to become brittle when the temperature falls below limits which are generally only slightly below and may occasionally be above 0° C." On the other hand, it should be borne in mind that satisfactory steel structures have been erected under very severe conditions of cold weather in the high mountain districts of Central Europe and also in Siberia. There seems, however, to be still wide scope for research on this point, particularly to ascertain the influence of low temperatures on welded joints.

The report of the Institute of Welding refrains from drawing final conclusions as to the causes of the collapse of the Hasselt bridge in view of the small amount of technical evidence available. It is, however, a source of satisfaction that the concluding points of the institute's report appear to be in full accordance with the concluding sentences of our report based on personal observation after the failure of the bridge,[8] when we said that we were "inclined to criticise certain details of the design of the bridge, the quality of the steel and the execution of the welds." The Institute's report before us concludes as follows:—"It is obvious that the failure must have been due to one or more of the following causes—(*a*) Overstressing, either generally or locally due to incorrect design; (*b*) Defective steel; (*c*) Defective weld metal; (*d*) Incorrect welding procedure and technique."

In Germany, too, several failures of welded bridges have occurred.[9] In these cases, the structural steel concerned was St. 52 of 52 kg. per sq. mm. minimum tensile strength, equivalent to 33 tons per sq. in. Details are given in Fig. 4. At the Zoological Gardens station, Berlin, two railway bridges were affected, one carrying a single track,

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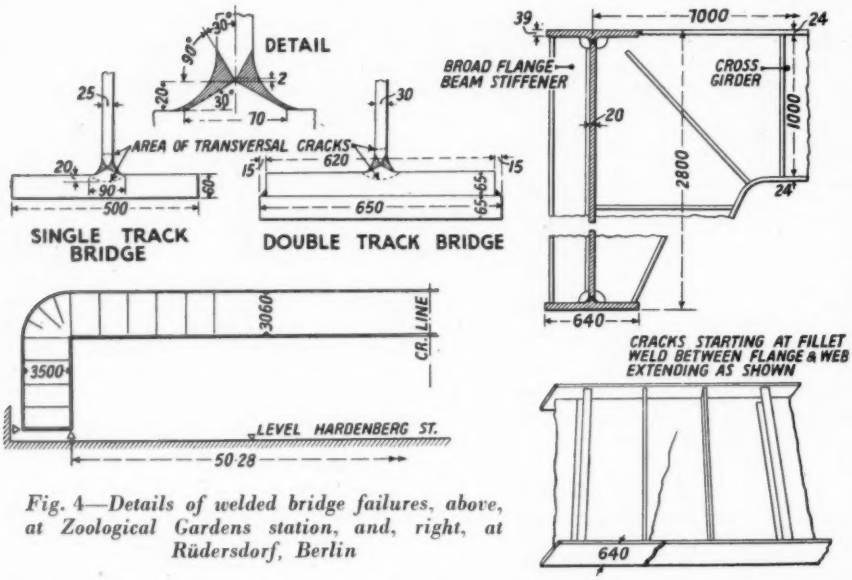


Fig. 4—Details of welded bridge failures, above, at Zoological Gardens station, and, right, at Rüdersdorf, Berlin

the other a double track. The flange plates were of the triangular bulge type as widely used in welded bridges in Germany. In 1936 transverse cracks were noticed in the fillet welds between web and flanges, extending well into the parent metal. Temporary supports were provided as a measure of safety without, however, actually relieving the loads. In 1938 both these railway bridges were replaced by riveted structures of St. 52.

At the Rüdersdorf Bridge, near Berlin, carrying a new motor road on 17 spans, totalling 3,280 ft., and including 6,300 tons of steel, two main girders failed in the night of January 2-3, 1938. It is noteworthy that the cracks shown in the sketch appeared after a fall in temperature of 10° C. during the night. Here, too, flange plates of the triangular bulge type had been used and cracks started apparently from the fillet welds, but in this case they extended much higher up through the web plate. It may be that the sequence of welding was an additional reason for producing these cracks. Stiffeners had been welded on to the web plate before connecting the flange plates to it. This method apparently resulted in restricting the shrinkage of the fillet welds between web and flanges, thus producing locked-up tension stresses in these fillet welds.

The general cause of these failures with welded structures of St. 52 in Germany seems to have been clarified by extensive tests with very thin welds on thick flanges of high thermal capacity. Hardening takes place in the deposited metal and this results in transverse cracks. Even if these cracks are only minute, they may easily develop into long cracks, as shown in the sketch. New forms of bending tests have since been devised, with light runs of weld metal deposited on thick plates.[10] The bending capacity of these plates was found to be considerably reduced by the deposited metal, in some cases from 180 deg. to 5 deg., which means that the capacity of deformation is practically lost. When using light welds on thick plates caution is necessary. This also refers to British steel of 28 to 33 tons per sq. in. tensile strength; here, too, the reduction in bending angles was found to be appreciable, although not as bad as with the St. 52.

The failures described above have had at least one beneficial effect: in various countries a large volume of research work has been initiated. The results which are already becoming available will no doubt act as a stimulus to improving further the standards of structural welding.

[1] *Transactions of the Institute of Welding*, vol. 3, No. 1, January, 1940.
[2] THE RAILWAY GAZETTE, May 20, 1938.
[3] *Ibid*, August 11, 1939.
[4] *Ibid*, March 8, 1940.
[5] F. Hecq, *L'Ossature Métallique*, Brussels, February, 1940.
[6] G. Schaper, Final Report, 1938, pp. 279–290, International Association for Bridge and Structural Engineering, Zurich.
[7] Prof. B. P. Haigh, *The Welder*, January-February, 1940.
[8] THE RAILWAY GAZETTE, May 20, 1938.
[9] G. Schaper, *Die Reichsbahn*, July 19 and 26, 1939.
[10] K. L. Zeyen, *Journal of the American Welding Society*, March, 1940.

Prevention of Track-Circuit Failures

IT sometimes happens that at turnouts and crossovers which are seldom used, but where track circuiting is installed, the collection of rust on the heads of the rails tends to insulate them sufficiently to cause faulty track circuits, upsetting the working of signals and interlocking.

To obviate this difficulty, the Pennsylvania Railroad has been experimenting since 1937 with a method of inserting copper strips into longitudinal grooves cut in the running surfaces of the rails, so as to form adequate conductors. Since the introduction of this arrangement, no instance of any trouble whatever has been reported, either in the form of signal failures or in regard to the permanence of the copper strips. Even a light traffic keeps the surface of the copper, which oxidises slowly, sufficiently clean to form a comparatively good contact.

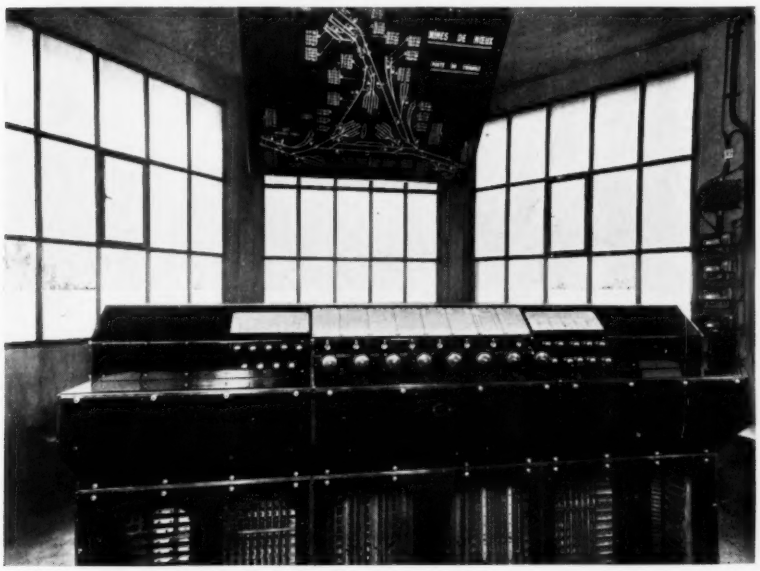
The strips are $\frac{3}{16}$-in. × $\frac{3}{16}$-in. in section and are of soft drawn metal, usually in 8-ft. to 14-ft. lengths. The grooves housing them in the heads of the rails are continuous, and are ground in at a distance of 1 in. from the gauge side of the head to the near side of the groove. In turnouts the strips extend along both rails to the insulated joints in the sidings, whereas in crossovers they run throughout the lengths of both turnouts and the track between them. In switches the strips end where the planing of each switch begins; in crossings they stop short of the nose by several feet. To insure that the strips shall not bridge insulated rail joints they are cut off short of these by 2 in. or over.

It is found in practice that the copper strip is held in the groove sufficiently firmly due to the roughness of the sides of the cut made in process of grinding, which is done by a grinder with a 30-grit medium-hard wheel that will grind the groove to its correct depth in about eight passes. So that the strips may be driven into the groove, the latter is cut to a depth of $\frac{11}{64}$ in. only, leaving $\frac{1}{64}$-in. of the strip projecting to allow of driving tight with a 2-lb. ball-peen hammer; the passage of traffic effectively completes the securing of the strip. About 65-70 ft. of rail can usually be grooved and copper-filled in an 8-hr. day, but this naturally depends on traffic interruptions. We are indebted to our American contemporary, *Railway Engineering & Maintenance*, for the above information.

POWER SIGNALLING AT THE NŒUX MINES, FRANCE

An interesting route control power frame, incorporating the mechanical selection principle and a multi-position route handle

BY the courtesy of Monsieur H. Pons, Technical Director of the Etablissements Saxby, of Creil (Oise), France, we reproduce photographs of an interesting route-setting power frame installed at the Nœux mines. It embodies the mechanical principle of selecting the point controls for each route, already used in a large number of French signalling installations, combined with a multiple-position route handle which controls up to 10 mutually conflicting routes and so effects a large reduction in the number of handles required for a given installation. The means by which this is secured are in principle the same as those employed by the same engineers to reduce the amount of conditional locking required in mechanical and electro-mechanical frames, and known as the route cylinder (*cylindre d'itinéraire*).



Interior of electric power signal box at the Nœux mines showing route handles and track diagram

In frames using the mechanical-selection principle the point motor control contacts are operated by the movement of what are, in effect, locking or slide bars, arranged longitudinally in the apparatus, and driven or held fast, as required, by cam or tappet lock action when a route handle is operated, ensuring the simultaneous operation of all points requiring to be set for the route in question. At the same time positive mechanical interlocking is obtained, between conflicting handles, without having to be worked out as such, by the constructional form of the apparatus, which some consider an advantage.

The principle of working of the Nœux mines type of frame will be readily understood from the accompanying diagram. The route handle A is first rotated so as to bring the appropriate designation marked on the indicator disc C (corresponding to the route to be set up) behind a window. This action rotates the shaft B and, by means of the bevel gear D and pinion gear E, the shaft F of the route cylinder. This last is formed of vertical bars G, mounted between the end disc plates H and J. These bars carry locking pieces K, in the positions required for each route concerned, and which engage with others on the horizontal point control slide bars L which actuate the point motor control contacts M and are subject to the electric lock N, as regards track and sectional route locking control or other deciding conditions. The lower part of the route-cylinder shaft operates certain selector contacts O.

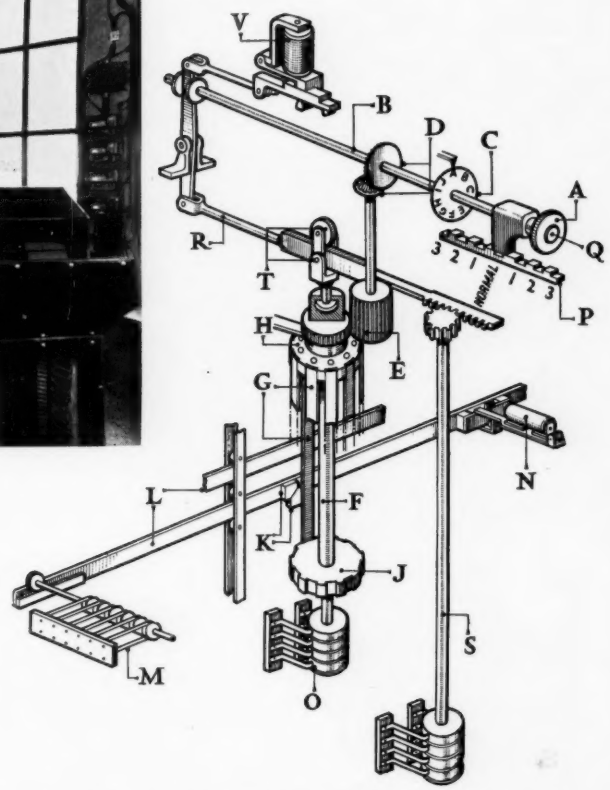


Diagram showing principles of the Saxby (Creil) multi-position route handle frame

After the route handle has been turned to the required position, the signalman either pulls or pushes it (according to the direction of the train movement involved), first releasing the retaining catch engaging with the " normal " notch in the plate P by pressing button Q. (This also, by mechanism not shown, closes the circuit to any electric locks involved, acting as an economiser contact.) The movement of the handle in either direction as far as notch 1 moves the control bar R in the opposite direction and rotates the signal-selection circuit shaft S, while the pinion and link connection T raises the whole route cylinder sufficiently to impart the necessary stroke to the slide bars L and actuate the point motor contacts. (Those bars, already standing in the required position, are merely held fast by this operation.) At the same time one of the

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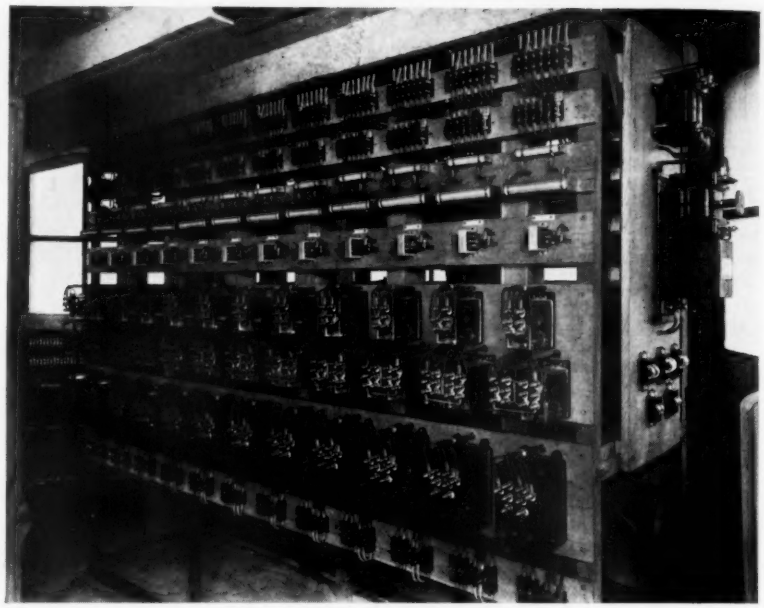
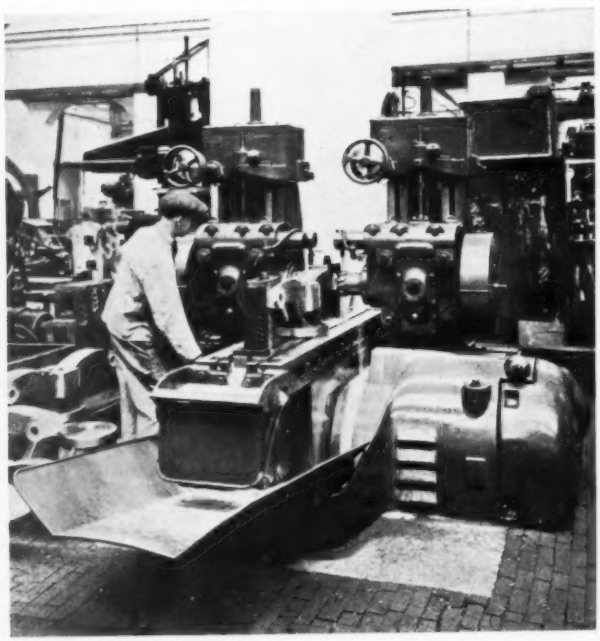
holes in the top disc plate of the cylinder engages with a pin fixed to the frame of the apparatus and becomes locked against any further movement. Further movement of the handle to notch 2 does not affect the cylinder, owing to blank tooth spaces in the gear detail T, but results in the clearing of the relative stop signal, provided that the points concerned have duly assumed the desired positions. Repeater or outer signals are cleared (if separate control over them is desired) by moving the handle to notch 3. Each handle is thus able to control 10 routes and traffic movements in both directions if necessary, or 20 movements in all. After a handle has been moved from the normal position it is mechanically impossible to move any other into a discordant position, owing to the tappet action of the cylinders and slide bars. The return of the handle to normal is dependent on the correct return of all signals affected to the "on" position and any route or other locking effect desired; electric lock V is provided for this purpose. The handles are spaced 120 mm. (nearly $4\frac{3}{4}$ in.) centre to centre, and a space of 400 mm. ($15\frac{3}{4}$ in.) allowed at each end of the frame—in some cases somewhat more—to contain emergency release buttons and other subsidiary equipment. A 10 handle frame can be accommodated in a length of 1·88 m. (6 ft. 2 in.). The frame at the Nœux mines, seen in the accompanying photographs, has 8 handles, at present controlling 108 routes (maximum capacity 160), 22 point motors and 21 signals. Another frame is being supplied containing 13 handles. Space can still further be saved by arranging the handles in more than one row, while the number of routes can be increased by using handles in combination, on principles already well known in France.



Interior of relay room

NEW MACHINE TOOLS AT DONCASTER WORKS

A duplex horizontal milling machine



Duplex horizontal milling machine at Doncaster

THE machine tool illustrated and described herewith* was recently installed in the locomotive works of the L.N.E.R. at Doncaster. It is designed primarily for repetition work on moderate or large quantities of details requiring parallel machined faces, and built to operate side facing cutters in both heads simultaneously. Details lending themselves to this class of processing can be set up and machined in quantities depending upon their size.

Slab milling is also carried out on the machine, which is fitted with overhead steady bearings to which arbors supplied with the machine can be attached, so that spiral milling cutters can be used as required. The machine, manufactured by James Archdale & Co. Ltd., Birmingham, is easy and quick to handle as it is fitted with quick-change feed and speed boxes, has localised control, and a table 4 ft. 6 in. long. Adequate room is provided for the use of jigs or fixtures where these operate on detail or repetition work, and the operations mainly carried out on the machine include such details as axlebox keeps, bogie stretcher extension pieces, and pony truck centres, and it is one of these last-named that is shown in the accompanying illustration being machined.

A speed range from 16 to 160 r.p.m. and a feed range of $\frac{3}{4}$ in. to 27 in. a minute are incorporated, and other important features are the quick forward traverse of the

* By courtesy of Sir Nigel Gresley, Chief Mechanical Engineer, L.N.E.R.

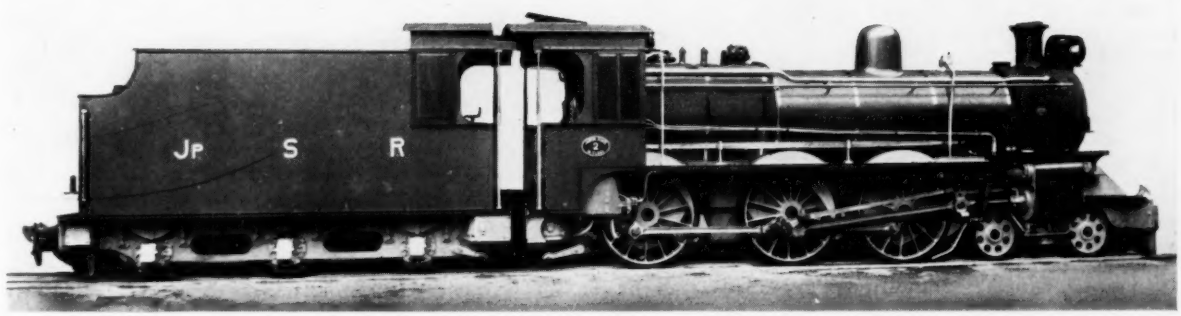
table to cutting position and intermittent forward feed providing table speed acceleration where the faces of details to be milled are some distance apart. On completion of full table stroke the spindles are automatically brought to rest and the table is returned to the starting position at a high speed.

Special features of the spindle head and drive are that the very large spindle runs in taper roller bearings with adjustable pre-load, and the spindle carries a large flywheel which has proved effective in smoothing out torsional vibration and chatter due either to the nature of the work, or to deflections in the driving members. The table is a deep cellular casting to resist distortion when clamping work, and has an automatic cycle consisting of a quick advance to the work moving at the selected feed rate across the work, and reverting, if necessary, to quick traverse across any gaps in the work. At the end of the traverse the spindle is automatically stopped and the table returned quickly to the starting position. These functions are controlled by dogs carried by the table, and which can be set to suit the work readily.

The machine is driven entirely by one self-contained motor conveniently housed in the bed of the machine, but readily accessible for cleaning and similar purposes. Stopping and starting of the spindle are effected by an improved friction clutch design which avoids all slipping in the drive and allows very prompt stopping of the spindle when required. Provision is made for rotating the cutter spindle in either direction to suit face milling or ordinary slab milling operations using cylindrical cutters. In the machine illustrated each spindle head has a range of eight spindle speeds independently selectable, and a feed gearbox giving 32 changes over a very wide range.

NEW METRE-GAUGE PASSENGER LOCOMOTIVES FOR INDIA

Six 4-6-0 *type engines for the Jaipur State Railway*



WE illustrate herewith one of six 4-6-0 type metre-gauge locomotives recently completed by the Hunslet Engine Co. Ltd. for the Jaipur State Railway, India. The engines, which have been built to the inspection of Messrs. Robert White & Partners, consulting engineers, London, are typical of modern design and construction for Indian locomotives on metre-gauge railways. The cylinders, to which steam is distributed by piston valves working above them and actuated by Walschaerts motion, are outside the frames and drive the centre pair of coupled wheels. The Belpaire boiler carries a working pressure of 160 lb. per sq. in.; the inside firebox is of copper with copper staybolts. Superheating apparatus of the Melesco type having 13 elements is fitted, and other boiler equipment comprises two Ross pop safety valves, and top feed clackboxes fed by two Gresham & Craven No. 8 injectors. The steam fittings are arranged on a steam stand on the top of the firebox and controlled where necessary from the footplate. A master valve is provided for isolating this stand if required, whilst the boiler is in steam. Cylinder lubrication is effected by means of a Detroit sight feed lubricator.

The engine frames are of the plate type and A.B.C. couplers are fitted. Vacuum brake apparatus is applied to the engine and tender, the latter also having a powerful screw hand brake. A Gresham & Craven Super Dreadnought ejector is employed. The electric lighting equipment is of the Pyle National type.

Main particulars are as follow:—

Cylinders, dia.	16½ in.
Piston stroke	22 in.
Wheels, coupled, dia.	4 ft. 9 in.
,, bogie, ,, ...	2 ft. 4½ in.
Wheelbase (engine)	27 ft. 1½ in.
,, rigid	12 ft. 10 in.
,, engine and tender	42 ft. 2¼ in.
Boiler working pressure	160 lb. per sq. in.
Heating surface, large (steel) tubes	207 sq. ft.
,, ,, small (steel) tubes	431 sq. ft.
Firebox	108 sq. ft.
Total evaporative	746 sq. ft.
,, superheater	150 sq. ft.
Combined total	896 sq. ft.
Grate area	16 sq. ft.

The tender is carried on six wheels of 2 ft. 4½ in. dia., and has a capacity of 2,500 gal. of water and 5½ tons of coal. The engine in working order weighs 35 tons 12 cwt., of which 27 tons is available for adhesion and is equally divided over the three coupled axles. The tractive effort at 75 per cent. of the boiler pressure is 12,610 lb. and the adhesion ratio 4·821. The weight of the tender in working order is 27 tons 18 cwt., giving a total for engine and tender in working order of 63 tons 10 cwt. The engine and tender will readily traverse a curve of 300 ft. radius.

XUM

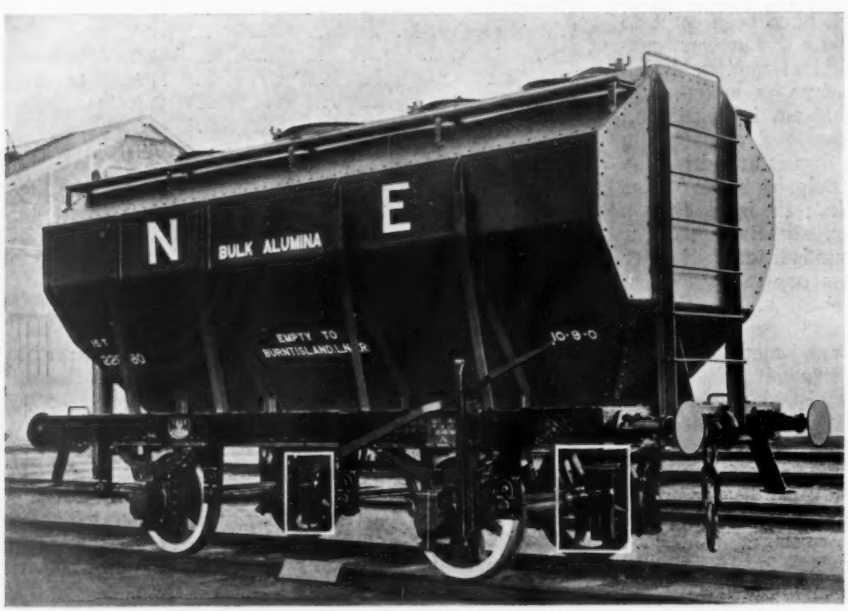
MODERNISED LIGHTING AT A NUT AND BOLT FACTORY

Use of Metrovick mercury-discharge lamp units in general overhead lighting scheme

IN a growing factory certain of the essential services, and particularly the lighting, are apt to become an awkward sprawling of extensions and adaptations. Each addition of factory has its own little group of lamps so that in the end the lighting becomes local and not at all in keeping with modern notions of what is best. In the Darlaston nut and bolt factory of Charles Richards & Sons Ltd., which has grown since its foundation in 1870 from an establishment employing 70 or 80 hands to one employing well over a thousand, the lighting has been completely overhauled twice. In 1914 the gas lighting was replaced by electric lighting and about twelve months ago, after a period of continual additions and improvements to the electric system, it was decided to replan the whole lighting layout. The work was undertaken by the Metropolitan Vickers Electrical Co. Ltd. and consisted in the replacement of a multiplicity of local lighting units over the machines by a general lighting scheme of Metrovick mercury discharge lamp units. Some care had to be taken to avoid shadows from overhead belting. About 100 mercury-discharge lamps were needed of sizes varying between 125, 250 and 400 watts. The general standard of illumination is 10 to 12 foot candles, but in some sections it is 20 to 25 foot candles.

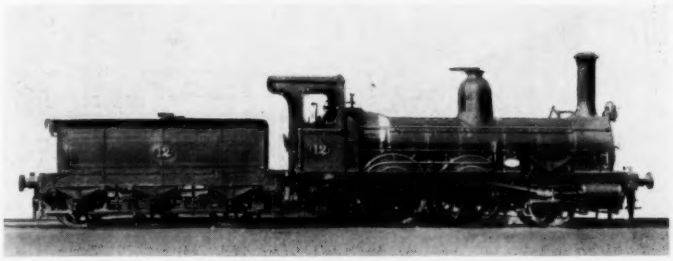
Installation of 400-watt mercury-discharge lamps at the factory of Charles Richards & Sons Ltd.

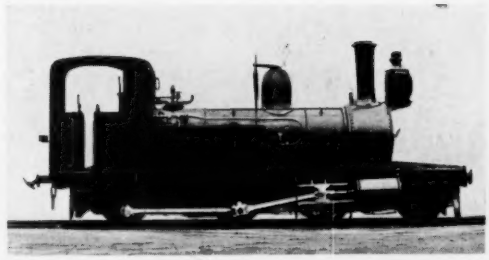
In an A.R.P. lighting installation, also carried out for Charles Richards & Sons Ltd. by the Metrovick engineers, some 30 shelters are each provided with a 6 volt lighting system fed through a transformer from the mains, but automatically turned over to an alkaline battery in the event of a supply interruption. The battery is kept charged by a metal rectifier built into the unit.



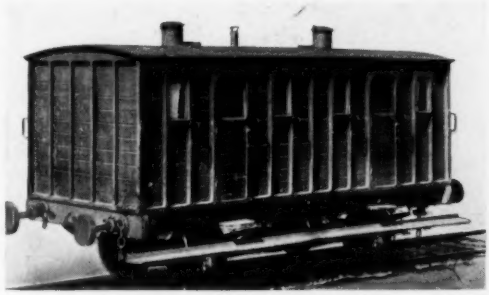
Left: L.N.E.R. 15-ton hopper wagon for the carriage of fine ores, such as bauxite, and fitted with four 6-in. Saunders diaphragm discharge valves with extended spindles for ease of operation. Two of the valves are ringed to show their position; the other two are hidden by the wheels

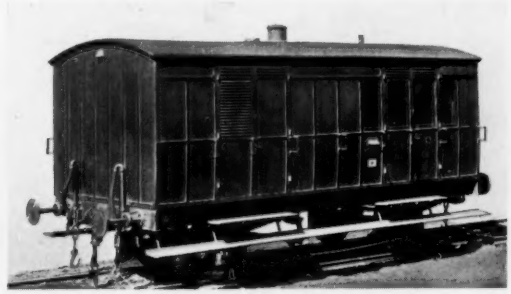
Norwegian Railway Museum Specimens



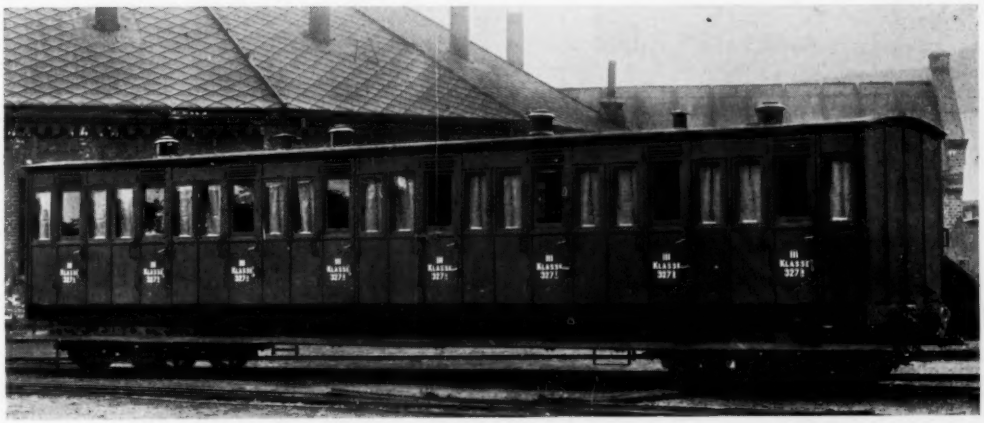


Standard-gauge 2-4-0 *locomotive built by Robert Stephenson & Co., of Newcastle-on-Tyne, in* 1863 *for the Hovedbanen, and (right)* 3 *ft.* 6 *in. gauge* 2-6-0 *Beyer-Peacock tank engine of* 1874 *for the Randsfjord line*





British-built (1870) *third class coach for the Hovedbanen, and (left)* 3 *ft.* 6 *in. gauge composite mail and luggage van built in the seventies at the Skabo works near Oslo*



Eight-compartment third class bogie coach built at the Skabo works in 1880 *for the* 3 *ft.* 6 *in. gauge Vestfold Railway, and still in service. The Vestfold Railway has been in course of conversion to standard gauge and the changeover was due for* 1941

The first railway in Norway, built under the supervision of Robert Stephenson and known as the Hovedbanen (*i.e.*, Trunk Railway), was opened in 1854 between Oslo (then Christiania) and Eidsvoll, and now forms part of the main line to Trondheim and the north. It was extended to Hamar in 1880, whence, until the Dovre line *via* Dombås was completed in 1921, the route to Trondheim was the 3 ft. 6 in. gauge line *via* Röros. At Hamar, where the break of gauge occurred, the Norwegian State Railways established a museum in which the specimens illustrated in the top four pictures were housed, and where the coach shown in the bottom picture would probably have found a niche

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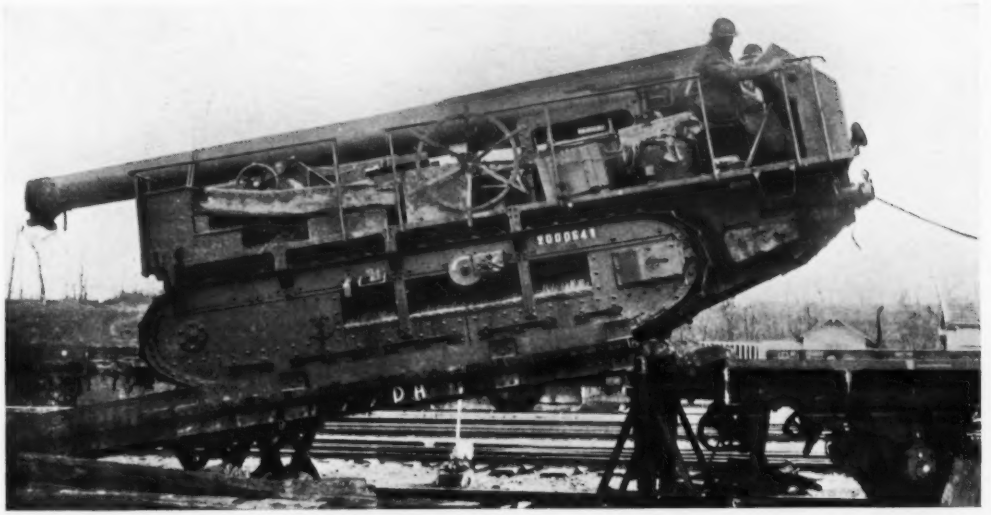
Railways and the War—23

The Royal waiting room at Paddington station, G.W.R., converted into a casualty clearing station. A practice is seen in progress



Heavy gun-carrying tank with the French Forces being loaded on a flat railway truck under its own power

Scene in a ward room on a British hospital ship. This particular vessel, which is a converted cross-channel passenger steamer, has accommodation for 300. The scene appears to be the lounge or dining saloon

RAILWAY NEWS SECTION

PERSONAL

From *The London Gazette*, June 7, 1940: Commissions signed by the Lord Lieutenant of the County of London: Major the Hon. Sir Edward Cecil George Cadogan, K.B.E., C.B., J.P., to be a Deputy Lieutenant for the County of London.

Mr. W. F. Drysdale, Vice-President of the Montreal Locomotive Works since 1932, has been appointed Director of Munitions (unpaid) in the Canadian Department of Munitions & Supply.

The Imperial Service Medal has been awarded by the King to Mr. C. G. Carn and Mr. William Roberts, who are gangers in the employment of the Tasmanian Government Railways.

Mr. E. J. Buckton, B.Sc., M.Inst.C.E., M.I.Mech.E., of Messrs. Rendel, Palmer & Tritton, has been elected Chairman of the Association of Consulting Engineers for 1940-41.

Sir Athol Anderson, K.C.B., Member of Council of the Institution of Civil Engineers, and formerly Civil Engineer-in-Chief of the Admiralty, has, subject to any Government requirement for his services, joined the firm of Messrs. Rendel, Palmer & Tritton, Consulting Chartered Civil Engineers, as one of its Consultants.

Mr. Alfred J. Ruane, Brake Engineer, Westinghouse Brake & Signal Co. Ltd., is retiring from this position after 52 years of service. A presentation of a silver salver was made to Mr. Ruane on June 4 on behalf of the directors and members of the staff of the Westinghouse Company. In addition, a copy of the resolution of the board expressing appreciation of Mr. Ruane's services was also handed to him. The directors of the company have decided, in view of Mr. Ruane's expert knowledge extending over such a long period, to appoint him a consultant and also a Member of the Westinghouse Patent Advisory Committee.

The London & North Eastern Railway announces that Mr. W. Charlton, Divisional Police Superintendent, Newcastle, has been appointed Divisional Police Superintendent, Scottish Area, in succession to Mr. D. Shepherd who retired from the company's service on May 20.

THE INSTITUTION OF LOCOMOTIVE ENGINEERS

The following transfer from associate membership to full membership was made on May 28:—

Robert Lewis McIlmoyle, Chief Engineer's Office, L.M.S.R., Watford.

Mr. A. B. Cane, whose death we recorded in our issue of January 5, has left estate valued at £21,000 (net personalty £16,836). Mr. Cane was Secretary of the Railway Companies' Association from 1909 to 1929.

WESTERN AUSTRALIAN STAFF CHANGES

Consequent on the recent retirement of the Chief Mechanical Engineer and the Workshops Manager, Mr. T. Marsland has been appointed Assistant Chief Mechanical Engineer and Chief Draftsman, and Mr. W. Raynes has been appointed Workshops Manager of the Midland junction shops.

Mr. Marsland became Assistant Workshops Manager at Midland junction in 1937. He received his early technical education at the Ardwick Higher Grade School, Manchester, and gained an exhibition entry to the Manchester College of Technology. He began an apprenticeship with Beyer, Peacock & Co. Ltd. in 1909, and later entered the drawing office as a junior draftsman. During the last war he served with the Royal Field Artillery for 3½ years. On returning to civilian life he rejoined Beyer, Peacock & Co. Ltd. as a draftsman, but resigned later to take up a position as electrical locomotive designer with the Metropolitan Vickers Electrical Co. Ltd. He left England in 1928 on his appointment to the Western Australian Government Railways as a locomotive draftsman. He is a member of the Institution of Locomotive Engineers (London).

Mr. Raynes, who has been Mechanical Inspector in the department for the past six years, joined the railway service at Geraldton in 1908. He received a technical education at the Midland junction and Perth Technical Colleges. During the last war he was engaged on munitions work with Vickers Limited at Barrow-in-Furness, gaining experience in marine engines, hydraulic press tools, and submarine construction. Later, at Crayford, he was engaged as a toolmaker on high class jigs and fixtures for machine gun and paravane components, and light press tools for aeroplane construction. After the war he worked as a toolmaker with several firms in Detroit, U.S.A. During his stays in England and America he gained valuable knowledge of mechanical mass-production, and studied various methods of locomotive construction. He is an Associate Member of the Institute of Locomotive Engineers, London.

Their Majesties the King and Queen with Sir Felix Pole on the occasion of a Royal Visit to one of the works in the Associated Electrical Industries group

We regret to record the death on June 7, in a nursing home at Windsor, of Mr. John Phillimore, the well-known authority on transport and its history. He was the younger son of the late Rev. Arthur Phillimore, and was educated (1900-1905) at Eton, where he was in Mr. Ramsay's house, and at Trinity College, Cambridge. He served in France with the R.A.S.C. Motor Transport during the war of 1914-19. Mr. Phillimore was for many years the Motoring Correspondent of *The Times*, and his wide knowledge of road trans-

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The late Mr. John Phillimore

A leading authority on transport and its history

Mr. Alex. J. Webb

Outdoor Superintendent (Railways), London Passenger Transport Board

Mr. J. A. Martin

London Manager, Canadian Pacific Steamships Limited, 1921–1940

port embraced private cars, commercial vehicles, and traffic problems. He was an occasional contributor to THE RAILWAY GAZETTE, chiefly on railway historical matters, and always evinced an accurate and detailed knowledge. His London house, at 5, Eccleston Square, was a veritable museum of prints, books, and other relics, relating to railway and road transport.

Mr. Alexander John Webb, Outdoor Superintendent (Railways), London Passenger Transport Board, entered the service of the London Underground railways in 1914. Almost immediately afterwards he enlisted, was commissioned in the Essex Regiment, and was on active service in France. At the end of 1917 he was seconded to the Admiralty, where he remained until he was demobilised in 1919, when he resumed service with the railway. He received a wide practical training in the various sections of the Operating Department, and in 1923 he was appointed Assistant to the Superintendent of Rolling Stock. In 1925 he was placed in charge of the training school at Lambeth North, and in 1927 was appointed District Traffic Superintendent. As a result of an exchange of operating officers between the Southern and the Underground companies, Mr. Webb was attached to the Southern Railway for three months in 1929. He was made an officer of the board, with the title of Assistant Divisional Superintendent, in 1936, and in 1938 was promoted to be Superintendent (Outdoor). He is Chairman of the Committee of the London Transport (Metropolitan Lines) Ambulance Centre of the St. John Ambulance Association, and earlier played an important part in the formation of the Metropolitan Graduate & Student Society of the Institute of Transport. He is an Associate Member of the Institute of Transport. Mr. Webb's maternal grandfather, the late Mr. Alexander Jamieson, was in the service of the Caledonian Railway for 50 years, and was the recipient of many presentations at the time of his retirement in February, 1908. Mr. Webb's father, the late Mr. S. J. Webb, served the Metropolitan District Railway for 37 years, latterly as Passenger Agent.

Mr. J. A. Martin, London Manager of Canadian Pacific Steamships Limited, is retiring at the end of this month after 50 years of service in the clerical, executive, and administrative departments of the Allan Line and of Canadian Pacific Steamships. Mr. Martin joined the staff

Mr. H. T. Hutchings

Indoor Superintendent (Railways), London Passenger Transport Board

Mr. Frederick Sadler

Divisional Superintendent, London Passenger Transport Board

Mr. C. M. Wentworth

Divisional Superintendent, London Passenger Transport Board

of the Allan Line at Glasgow in 1890 and in 1909 was appointed Secretary of the company. He became a Director of Allan Bros. & Co. (U.K.) Ltd. in September, 1912. In 1915 he became Assistant to the Manager-in-Chief, Ocean Services, Canadian Pacific and Allan Line, at Liverpool, and on the formation of Canadian Pacific Ocean Services Limited, he was made Assistant Manager with headquarters in Liverpool; he became Manager in 1919. In 1921 he was appointed Manager, Canadian Pacific Steamships Limited in London, the position he is to relinquish shortly.

Mr. H. T. Hutchings, Indoor Superintendent, London Passenger Transport Board, began his railway career on the Central London Railway in 1909, when that line was a separate entity. He left the service after about two years, but in 1913 joined the Underground group in the office of the Superintendent of the Line. During the 1914-19 war he served in France with the R.O.D. on light railways. In 1920 he was selected for the special training scheme then in operation on the Underground lines, and was given opportunity for studying all aspects of operating work. In 1925 he acted as Assistant (Indoor) to the Superintendent of the Line, and later became personal assistant to the General Manager, Mr. J. P. Thomas. He was appointed Assistant Divisional Superintendent in 1933, and in 1938, when a general re-organisation of the Operating Department took place, he became Indoor Superintendent.

Mr. Frederick Sadler, Divisional Superintendent, London Passenger Transport Board, joined the District Railway in 1905 as a member of the station staff, and worked in various grades until the outbreak of war in 1914, when he joined the 2nd Queen's Regiment. He fought at Mons, the Marne, Aisne, and Ypres, and was wounded and taken prisoner. He resumed railway service in February, 1919, and was for a period a motorman on the District Railway. He was appointed to the supervisory grades in 1920 as Yardmaster at Acton Town depot, and in 1923 was made District Inspector, Acting Traffic Controller. Three years later he became Assistant Divisional Superintendent, which position he held until 1933, when he was made Traffic Superintendent of the Bakerloo and Central Lines. In 1937-38 Mr. Sadler acted as Superintendent of Staff, and was appointed Divisional Superintendent, 1938. Last year he became an officer of the board. The District Railway on which he began his career is one of the lines which he now superintends.

Mr. Charles Matthew Wentworth, A.M.Inst.T., Divisional Superintendent, London Transport, began his career with the Baker Street & Waterloo Railway in 1906. He gained experience in the office of the Superintendent of the Line and in all grades of the Operating Department. In 1924 he was appointed Training Inspector, and two years later was promoted to be District Inspector, Hampstead and City Lines. In 1928 he was appointed Assistant District Superintendent in the same area, from which he was subsequently transferred to the District and Piccadilly Lines in 1933. After four years he became District Superintendent, Edgware—Morden Line. In 1938 he was made Divisional Superintendent of the Northern and Central Lines. Fourteen months later he was appointed an officer of the board.

Mr. Roger Thomas Smith has left estate valued at £4,518. Mr. Smith was Electrical Engineer of the Great Western Railway from 1905 to 1924. A portrait and biographical notice were published at page 647 of our May 3 issue.

M. Gigurcu, Minister of Communications, Roumania, has become Foreign Minister, and his place as Minister of Communications has been taken by M. Ion Macovei.

Señores Fernando del Pino, Fernando Moreno, Juan Senespleda, and Alfredo de Alburquerque, have been appointed Assistants to the General Manager of the Andalusian-National-Western Railway.

Indian Railway Staff Changes

Mr. H. G. Salmond, Deputy General Manager, Works and Secretary, E.B.R., has been granted an extension of 4¾ months' leave, as from May 8.

Mr. R. Bonar has been appointed to officiate as Chief Mechanical Engineer, E.I.R., as from February 23.

Mr. G. W. Browne has been appointed to officiate as Deputy Chief Mechanical Engineer, in place of Mr. Bonar.

Mr. Yaqub Shah has been appointed to officiate as Director of Finance, Railway Board, in place of Mr. T. S. Sankara Aryar, C.I.E., granted three months' leave.

Mr. E. L. Manico, V.D., Officiating Chief Operating Superintendent, N.W.R., has been granted four months' leave as from April 10.

Mr. H. L. W. Stevens has been appointed to officiate as Controller of Stores, M. & S.M.R., as from May 2, in place of Mr. A. C. Turner granted five months' leave.

Major W. S. E. Money, Personnel Officer, M. & S.M.R., has been granted leave preparatory to retirement as from March 10.

Mr. M. A. Merchant has been appointed to succeed Major Money as Personnel Officer, M. & S.M.R., as from April 25.

Khan Bahadur Muzaffar Hussain has been confirmed as a Member of the Railway Board.

Lt.-Colonel H. W. Wagstaff, M.C., R.E., has been confirmed as Director of Establishment, Railway Board.

Mr. Frank Potter, Superintendent of the Line, G.W.R., whose serious illness we announced last week, continues to make progress.

We regret to record the death on March 4 of Mr. W. T. Dunsdon in his 86th year. Mr. Dunsdon was Divisional Engineer, Wolverhampton, Great Western Railway, at the time of his retirement in 1919.

We regret to record the death on March 17, at the age of 62, of Mr. H. S. B. Whitley. Mr. Whitley, whose retirement we announced in our issue of November 17, was formerly Divisional Superintendent, Wolverhampton, Great Western Railway.

L.M.S.R. Appointments

The following appointments are announced :—

Mr. S. Roberts, District Goods Manager, Wolverhampton, to be District Goods Manager, Birmingham, *vice* Mr. J. B. Scattergood, retiring.

Mr. L. C. Brittlebank, District Goods & Passenger Manager, Chester, to be District Goods Manager, Wolverhampton, *vice* Mr. S. Roberts.

Mr. R. D. Roberts, Docks Superintendent, Garston Docks, to be District Goods & Passenger Manager, Chester, *vice* Mr. L. C. Brittlebank.

Mr. A. S. L. Thomson, Head of Section (Docks and Canals), Chief Commercial Manager's Office, Watford, to be Docks Superintendent, Garston Docks, *vice* Mr. R. D. Roberts.

Mr. A. J. Broughton, Assistant Irish Traffic Manager, Dublin, to be Irish Traffic Manager, Dublin, *vice* Mr. J. M. Irwin, retired (see The Railway Gazette, January 12, page 60).

Mr. T. A. Burke, Commercial Assistant, Irish Traffic Manager's Office, Dublin, to be Assistant Irish Traffic Manager, Dublin, *vice* Mr. A. J. Broughton.

Mr. C. Beastall, Chief Draughtsman, Chief Engineer's Department, Derby South, to be Acting Assistant to District Engineer, Derby South, *vice* Mr. I. R. Frazer, promoted.

Mr. A. W. G. Collins, Goods Agent, Willesden, to be Goods Agent, Commercial Road, *vice* Mr. W. H. Letts, transferred.

Mr. G. B. Parker, Goods Agent, Canning Town & Victoria Docks, to be Goods Agent, Willesden, *vice* Mr. A. W. G. Collins.

Mr. F. Wilson, Chief Clerk, Commercial Road, to be Goods Agent, Canning Town & Victoria Docks, *vice* Mr. G. B. Parker.

Mr. C. R. Hughes, Chief Transit & Station Working Clerk, District Goods Manager's Office, Wolverhampton, to be Joint Goods Agent, Walsall & Bloxwich, *vice* Mr. G. C. Harvey, retiring.

Mr. A. Sirmon, Goods Agent, Tipton, to be Goods Agent, Oldbury, *vice* Mr. W. T. Nash, retiring.

Mr. W. P. B. Bowater, Goods Agent, Brierley Hill, to be Goods Agent Tipton, *vice* Mr. A. Sirmon.

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TRANSPORT SERVICES AND THE WAR—42

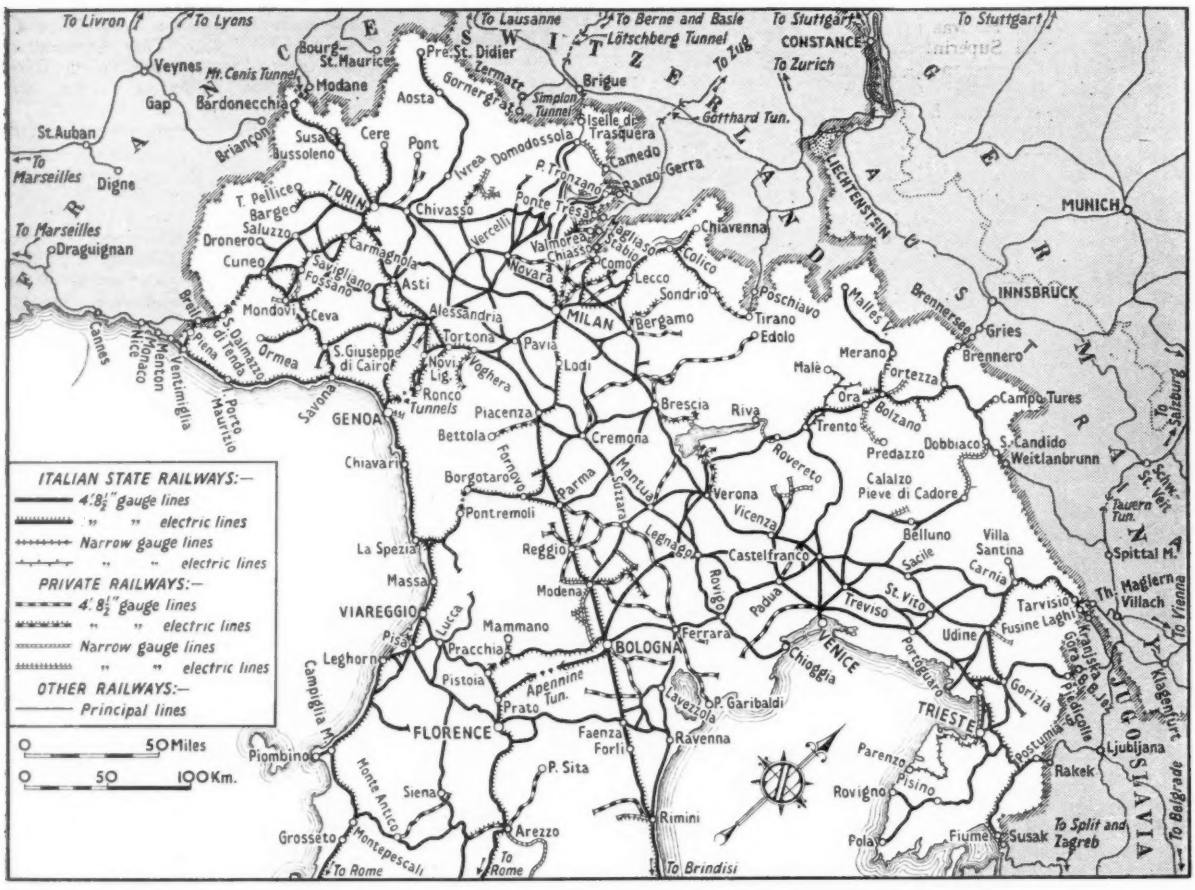
German coal traffic to Italy—Algerian railways in wartime—Swiss railways and the war—The Netherlands railways in German occupation

The announcement made on Monday evening (June 10) by Mussolini that Italy had declared war on Great Britain and France has affected practically all communications between the west and east of Europe. It is too early yet to assess the military importance of Italian intervention, but the immediate result on land transport is to sever all rail and road communication with the Balkans. During the war of 1914-19 it will be remembered that the interruption to the Orient Express was met in part by the establishment of the Simplon-Orient Express running through northern Italy and thus keeping to what was then allied territory. Below we reproduce a map showing the railways of northern Italy in their relation to the frontiers of France, Switzerland, Germany (Austria), and Jugoslavia. From the other viewpoint, the inclusion of Italy among the belligerents closes the most important neutral access to Germany for supplies.

The German Coal Traffic to Italy

The fact that Italy is now at war also increases the importance of the German coal traffic to Italy, some details of which have already appeared in these columns. It will be remembered that when the conveyance of German coal to Italy by sea was stopped by Allied action, Germany undertook to deliver approximately 1,000,000 tons a month by rail. Precise information about the exact volume of coal that has passed is lacking but there is no doubt that within recent weeks it has been very extensive. A day or two before Italy entered the war, a Rome message stated that during the month of May Italy received 987,000 tons of coal by rail from Germany, and the Stefani Agency emphasises that, despite the large-scale military activities during that month in the western coal basins, Germany continued to effect regular deliveries of coal to Italy according to the fixed schedule.

It seems that four main routes are used, namely, the two through Switzerland (the Basle—Lötschberg—Simplon, and the Gotthard); the Brenner, between Austria and north-eastern Italy; and the route by Tarvisio which is reached from Germany *via* Munich, Salzburg, and the Tauern tunnel, and also (more circuitously) *via* Passau and Linz. The last-named route (namely, *via* Tarvisio), is also the direct line to Italy from Poland and Czechoslovakia *via* Vienna. In addition, it is understood that a certain amount of traffic is being carried through the extreme northwest corner of Jugoslavia to Trieste and Fiume *via* Postumia, but it is reported that the Jugoslav State Railways have placed a limit of five



The railways of Northern Italy in relation to neighbouring territories

trains a day on this additional transit coal traffic. Except by the Tarvisio route, the whole of this transit coal traffic is worked in German wagons, mostly of 20-ton capacity. Italian wagons are used on the Tarvisio route and, as these are not continuously braked, a proportion of them is equipped for hand-brakesmen for negotiating the steeply graded line, which has gradients of as much as 1 in 50. On the Italian side of the frontier the railway is electrified between Tarvisio and Udine, but on the German side, where the trains are steam-hauled, they are double-headed with an assisting engine in rear. The German coal is not being conveyed entirely in whole trainloads, for most goods trains between Germany and Italy have coal wagons attached. The entire coal trains are made up to some 30 wagons a train; the approximate capacity of a fully-laden coal train is thus between 500 and 600 tons. Probably more trains reach Italy mixed than run mixed for the major portion of their journey in German territory, as the trains have to be divided on heavily-graded sections and reformed on the south side of the Alps.

Coal appears to be off-loaded in northern Italy, as German wagons are not seen in southern Italy. It is understood that a certain proportion is carried in Italian coastwise steamers from northern Italian ports to southern Italy. The importance of Switzerland in this transit traffic probably became considerably less towards the end of May and onwards, in view of the disturbances and part closure of the railways between Germany and Switzerland.

Algerian Railways in Wartime

Some interesting particulars of the work done by the Algerian railways since the outbreak of war have been published by our contemporary *Notre Métier*, the staff magazine of the French National Railways. Situate as they are in the centre of the railway system of North Africa, the Algerian railways had an important part to play immediately on mobilisation. First, they had to provide for the transport of reservists rejoining the colours; secondly for the conveyance of ordinary passengers returning from leave in France, who numbered many thousands a day; and finally for the concentration and re-distribution of certain military units. In order to provide for this extra traffic, train services were increased so as to attain on certain sections of the line between Algiers and Constantine, for example, a frequency more than three times as much as the normal. This performance was the more remarkable in view of the problems arising out of such an intense movement on a single line of heavy gradients. It was rendered possible by making an extended use of the trains dispatching circuit ordinarily in operation. This single circuit was found to be insufficient, and a second circuit was accordingly placed at the disposal of the Algerian railways by the Department of Posts, Telegraphs, and Telephones, for connecting important stations between Algiers and Constantine. Eventually a third circuit was brought into use to provide direct communication between the suburbs of Algiers and Constantine and the depots dependent on them. Notwithstanding the exceptional strain, traffic was worked without any serious mishap, and material delays were relatively few.

The average daily runs of steam locomotives were increased as much as 15 per cent.; the chief improvement was one of 35 per cent. in the department of Constantine. Amongst the hardest-worked depots were those of Bordj-Bou-Arréridj, situate about half-way between Algiers and Constantine, and those of Sidi-Mabrouq and Ménerville. The Beyer-Garratt locomotives facilitated working on the heavily-graded section between Ménerville and Bordj-Bou-Arréridj, as also did other locomotives received from the French National Railways Company on the sections between Bordj and Sétif and between Constantine and Duvivier. Mobilisation caused a diminution of staff, and in consequence of this and of the increased traffic, a great strain was placed upon all grades. Some trainmen had to work more than twelve hours a day in order to enable them to obtain a day of rest. Station staffs from branch lines and even shopmen had also to be brought in to reinforce the train staffs. On September 27 the military authorities, in an order of the day, expressed their appreciation of the devotion and efficiency shown by all the railway employees and of the technical skill of the railway management. They also expressed their gratitude and congratulations to all who had contributed to the organisation and carrying out of the transport movements. Immediately after mobilisation there was some setback in traffic, but recently it has shown signs of a revival of some importance. The management has progressively re-established passenger train accelerations on all lines, so as to provide on the principal routes two trains each way daily; it has also put in service a certain number of trains for soldiers on leave. Commercial merchandise traffic has got back to its peacetime dimensions and on certain lines has exceeded them. This increase is due partly to the requisition of motorcars and lorries, which has brought back large consignments to the railways. This information relates, of course, to the days immediately before Italy entered the war. The new strategic importance of Algeria is obvious.

Swiss Railways and the War

As a result of the invasion of Holland, Belgium, and Luxembourg, general mobilisation was ordered in Switzerland on Friday, May 10, for the next day, as a precautionary measure. The special war timetable which had been in force between September 2 and October 7, 1939, was again applied from midnight on May 10. Traffic on the portion of the Zurich—Eglisau—Schaffhausen main line (part of the Zurich—Stuttgart—Berlin route) situated in German territory was suspended after arrival of the northbound express at Schaffhausen at 7.49 a.m. on May 10, and traffic between Zurich and Schaffhausen was therefore diverted *via* Winterthur. The Federal line from Etzwilen to Singen (partly in Germany) was also closed to traffic. On the other hand, no restrictions were placed on the working on Swiss territory of the Reichsbahn line from Basle to Constance, which cuts across the canton of Schaffhausen and has several stations in Switzerland. The Swiss-German frontier between Basle and Constance was closed to local traffic by both countries on May 16, and the Rome—Berlin express which normally runs *via* Schaffhausen was re-routed through St. Margrethen. It was announced on May 24 that traffic had been resumed on the (Zurich—) Eglisau—Schaffhausen line of the Swiss Federal Railways, all trains passing non-stop and with closed windows through the stations in German territory. The Etzwilen—Singen line had been re-opened a week earlier.

By virtue of a decree dated August 29, 1939, the Federal Council of the Swiss Federation, as announced in THE RAILWAY GAZETTE of October 20, 1939, on page 529, placed the railway system of Switzerland on a war footing as from 12.1 a.m. on September 2, 1939. The Council nominated as Military Director of Railways, in charge of both Federal and private lines, Dr. Maurice Paschoud, General Manager (Head of Works and Operating Departments), Swiss Federal Railways, with the rank of Colonel. Operation of road transport and steamships also came under control. All direct military requirements had to be met in accordance with the orders of the Commander in Chief of the Army, and it was the duty of Colonel Paschoud to furnish the equipment and the operating facilities, including the provision of a large number of motor vehicles, necessary for carrying out these requirements. Otherwise, generally speaking, the administration of the railways remained on a peacetime footing. Although the administration had only a few hours in which to change over from normal working to the war timetable, this operation had long been foreseen and preparations had been made to enable it to be effected without a hitch. During the first two days of mobilisation traffic was exceptionally heavy. Not only were those of military age preparing for their mobilisation, but foreigners visiting Switzerland were departing in haste. Besides the ordinary trains provided in the war timetable, special military trains were run day and night. Despite the very heavy demands on the railway personnel and equipment, the task was carried out punctually.

The annual report of the Swiss Federal Railways for the year 1939 shows that the administration provided the number of steam locomotives required to meet the needs of the army and the supply of commodities of all kinds needed for the population. In order to facilitate the entraining and detraining of troops, additional platform accommodation was provided

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at a number of stations, and preparations were made for emergency platforms at other points. Most of the material required for temporary bridges had been assembled. Orders were also given for the construction of certain works designed to secure the maintenance of electric traction in the event of war, and stocks of materials required for repair work and ordinary operation have been accumulated. For the rapid reinstatement of bridges and electrical installations which might be destroyed in the event of war, detachments have been formed of military and other units. These men have undergone a course of instruction in their duties, and have since been familiarised with the materials they would require to use. Other detachments have been formed for the repair of damaged permanent way. The administration has also provided the ambulance trains required by the army.

The Railways of Holland

Railway services in Holland have been entirely disorganised since the first day of the German invasion, May 10, and the volume of war damage to bridges, etc., is such that it will take the invaders a considerable time to restore anything approaching normal working. Three wide rivers, the Rhine, Waal, and Meuse, flowing across the entire width of the country from east to west, form a natural division between the northern and the southern portions of the Dutch railway system. Each main line connecting the two portions passes across three long bridges, and most of these were destroyed on the first day of the invasion. The only north-south connection now available is the Rotterdam-Antwerp line, on which the bridges were not blown up, the idea being that this line would continue to serve as a necessary link between the Dutch and the Belgian armies. As is now known, the German armies advanced in Brabant, and by the now too well-known means, foul and fair, succeeded in occupying this railway before it could be put out of use.

In the southern part of the country the Meuse flowing practically along the German border divides the Dutch system from the German. Here all the railway bridges were destroyed. In the northern half the Yssel river flowing from the Rhine into the former Zuider Zee at Kampen separates the central lines from those in the eastern and northern provinces. Here again the bridges were blown up or damaged with the exception of the one on the main line through Arnhem to Zevenaar and Emmerich. On June 9, Berlin announced a regular through train service between Berlin and The Hague. The position is therefore that the Dutch system is now divided into three parts, a central part west of the Yssel, a north-eastern part open to Germany, and a southern part south of the large rivers and behind the Meuse, with only one practicable normal rail communication between any two of the three parts.

Many of the Dutch railways form possible alternative lines of communication between north Germany and the western front, and it must be obvious that the Germans are doing all they can to restore certain of the destroyed communications across the Dutch river systems. Some of the interior lines are of value for the transport of Dutch produce, mostly potatoes and other vegetables and possibly dairy produce, which no doubt has been secured for distribution in Germany proper. Much of Holland's consumption goods was imported, and no large stocks were available at the time of the invasion. Many oil and petrol depots have been destroyed, but the coal mines in southern Holland are believed to be intact.

With regard to rolling stock, the Germans have been able to lay their hands on all the rolling stock not destroyed in the five days of fighting. At the time of the invasion the Dutch railways had approximately 1,050 steam locomotives, 3,100 carriages, and 28,000 wagons. The electric stock, using 1,500 volts d.c., with overhead contact, can be used only for internal service. The diesel stock, like that in Germany proper, is of little use in view of the shortage of fuel. The steam rolling stock had greatly decreased in numbers during the last few years of ever-expanding electric and diesel services, and the figures given above show that no very important increase to the German rolling stock can have occurred. A few hundred Polish wagons have been in Holland since September last. These wagons had been claimed by the Reichsbahn ever since Poland was brought under German rule, but up till last month the Dutch had refused to hand them over. Just before the invasion, as German pressure increased, it was stated that the international legal adviser of the Dutch Government had established the legality of the handing over of these wagons.

Aliens and Protected Areas

The Home Secretary has made two further Aliens (Protected Areas) Orders declaring certain additional areas in England and Wales and Scotland to be protected areas. One of these Orders, which came into force on June 2, relates to certain parts of the Counties of Norfolk, Suffolk, Essex, Kent, and Sussex, and certain districts in Bedfordshire and Buckinghamshire; the other, which came into operation on June 10, relates to certain parts of the Counties of Northumberland, Durham, Dorset, Cornwall, Glamorgan, Monmouth, Gloucester, Somerset, Wilts, Lancashire, Cheshire, and Pembroke, and in Scotland to certain parts of the Counties of Argyll, Ayr, Dumbarton, Renfrew, Wigtown, and Perth, and the whole of the Counties of Angus and Bute. An alien may not enter or remain in any of these areas without the permission in writing of the Chief Constable or of the Secretary of State. As regards the protected areas in the parts of East Anglia, Kent, Sussex, Bedfordshire, and Buckinghamshire, aliens will not be allowed to remain in these areas unless their presence is required for special work of national importance. Another provision prohibits an alien from having in his possession or using in a protected area any camera or other photographic apparatus; any telescope, field glass, or similar optical instrument; or any nautical chart. It is permissible for an alien to pass through a protected area in the course of a continuous journey from a place outside the United Kingdom to a destination within the United Kingdom, or from a place within the United Kingdom to a destination outside the United Kingdom.

Free Travel to Soldiers in Hospital

In order to clear up misunderstandings which may have arisen on the point, the War Office announced, on May 31, that relatives of soldiers in hospital can travel at public expense to visit them, or be issued with police warrants, only if they have received an official telegram from the hospital notifying them that the soldier is dangerously ill and telling them definitely that if they cannot afford the expense of the journey they can get a warrant to visit him by applying at the nearest police station. Any relatives who wish to visit soldiers in hospital but have not received such a telegram may make the journey at reduced rates by using concession vouchers. These can be obtained from the Record Office of the Unit to which the soldier belongs.

Some L.N.E.R. Figures

During the first nine months of the war, no fewer than one million telephone enquiries have been dealt with in the L.N.E.R. enquiry offices at King's Cross and Liverpool Street stations.

During the three months of March, April, and May of this year, the L.N.E.R. used 255 tons of paper less than in the corresponding period in 1939. The saving has been achieved through drastic reductions in the numbers printed of posters, handbills, folders, timetables, and other advertising matter.

The Railways of Germany

During the past two or three weeks the railways, roads, oil storage tanks, refineries, chemical plants, and munition works in Germany and German-occupied territories have been subjected to intense and repeated attack by British and French Air Forces. Among the railway junctions and marshalling yards recorded as having been attacked are Hamm and Osnabrück (for the first time on June 1); Munich and Frankfort-on-Main (for the first time on June 3); the outskirts of Berlin; Mannheim; Ludwigshafen; Homburg; Soest (an important railway junction east of Dortmund); Dortmund itself; Aachen; Cologne; Essen; Düsseldorf; Wesel; and many other points in the Ruhr and in the Rhineland. According to official British and French statements, considerable success has attended these air attacks. Traffic at marshalling yards is stated to have been dislocated seriously, oil tank wagons wrecked and set alight by incendiary bombs, and moving troop and supply trains destroyed.

Railway Stockholders and War Risks

Sir Charles Stuart-Williams on Government Guarantee

Sir Charles Stuart-Williams, Chairman of the British Railway Stockholders Union Limited, in the course of his speech at the half-yearly meeting of the council on June 7, said that until the early days of May, when the attack upon Holland and Belgium was launched, the quotations of railway stocks had still reflected the results of the Government guarantee. Now the quotations revealed losses which took them back to the black days of September, 1939, when quotations were even lower than they were after the disastrous year 1938 in which £360 millions worth of ordinary and other railway stocks had gone without dividends.

During May, 365 representative securities, selected by the *Bankers' Magazine* as an index of Stock Exchange values, had fallen by approximately £200,000,000; a considerable amount of this was due to the ordinary stocks of British railways, which had suffered a fall of about 20 per cent. By comparison, the commercial and industrial group fell only 7 per cent. War and the inevitable setbacks of war were risks shared by all investors, but it was deplorable that the fall in railway stocks had coincided with the revelation that a speculative position existed, in spite of the fact that the Stock Exchange had established a ban on "contango business" which should have prevented any gambling.

The latest blow to the investing public had come at the end of May when the Chancellor of the Exchequer had announced that the Excess Profits Tax on all undertakings, as from the beginning of April, 1940, would be raised from 60 per cent. to 100 per cent. So far as could be seen this decision should not disturb the Government guarantee to railway stockholders. The law governing the Excess Profits Tax said that, when the profits earned by an undertaking reached that of its standard year (which might be 1935, 1936, or the average of 1935-1937, or the average of 1936 and 1937) any surplus went directly to the Exchequer. Here was a record of the profits earned by the companies in the three years and it is noteworthy that if the average of 1936 and 1937 were taken, as presumably it might be if there was no differentiation against railway stockholdings, the total was rather greater than if the three years' average were taken:—

Year	G.W.R.	L.M.S.R	L.N.E.R.	S.R.	Totals
	£	£	£	£	£
1935	5,450,559	13,027,525	8,371,373	6,072,297	22,921,754
1936	6,314,829	14,048,176	9,141,395	6,226,160	35,730,560
1937	6,886,505	14,355,276	10,107,442	6,552,124	37,902,347
Average of 1935, 1936 and 1937	6,217,298	13,810,659	9,206,736	6,283,527	35,518 220
Average of 1936 and 1937 ...	6,600,667	14,202,226	9,624,418	6,389,142	36,816,453

There was a discussion afoot to establish minimum prices to cover home railways, similar to the minima agreed for trustee stocks. He felt there was a great deal to be said for this proposal in view of the fact that immense quantities of railway stock were in the hands of executors.

It was the business of the union at all times to support the value of railway securities and, at the present time, it seemed all-important to emphasise the importance of the Government guarantee. The one stable thing was the State itself, and, in the case of railway stocks, they have the promise of the British Government backed by a vote of the House of Commons which would enable a modest dividend to be paid on most stocks throughout the duration of the War. They had pinned their faith to a great public utility, and one which was doing an immense war service, not only in Great Britain, but behind the Allied lines in France. It was a public utility which necessarily would continue to serve the country when peace was restored.

He did not conceal that special dangers threatened the industry. There was the threat of damage from the air, which was a factor in bringing about the marked fall of railway stocks last month, though not, he believed, the main factor. To the extent of the first £10 millions a year, any damage to railway property would be paid from the pool of net revenue, and no monies required to make good this damage would interfere with the minimum Government guarantee. Should intensive bombing begin there was no doubt that railways would be the objects of special attack, but there was no evidence that air defences of this country were so inadequate that these special attacks would be markedly successful. It seemed certain that a great deal of German bombing would be at random, in other words, the railways would suffer their share of the general damage, but very little more. Assuming that damage beyond £10 millions a year was done, the general loss would be so heavy that it would be difficult indeed to gauge the value of any industrial property, at any rate, on the eastern half of Britain.

There was also the question of wages. He had on previous occasions pointed out the dangers to railway stockholders' property which would arise from excessive wages demands and, in particular, from the National Union of Railwaymen's suggestions that railway trade unions were entitled to what was called a "comfort" wage. Far from being "poverty-stricken," railway workers were profiting from the fact that British railways were in the position of sheltered industries. Apart from great gains in respect of working hours and conditions of labour, British railwaymen were earning wages more than 100 per cent. above those ruling at the beginning of the last war. By comparison, holders of railway securities were incomparably worse off. Many of their securities were receiving no dividends at all, and in any case, they were receiving no more than they had in 1913 when the real value of money was at least 60 per cent. higher.

Another special danger which railway securities were facing was the ease with which public prejudice could be aroused against absolutely necessary increases in passenger fares and freight charges. The White Paper which had been endorsed by the House of Commons on February 13 gave an assurance that passenger rates and freight charges should be raised to meet any rises in the cost of working. The assurance was essential if British railways were to be maintained on an economic basis and the pernicious policy of Government subsidies avoided. A suitable subsidy from the Exchequer would no doubt have saved the general managers from a good deal of anxiety and spared them much criticism from an ill-instructed public. As a fact, the rise in railway rates and fares was very small. It was only 10 per cent. and did not cover the rise in the cost of material, wages and similar considerations and still less the extra 3s. a week in wages granted on June 1.

The executive was continually exploring the problems which were certain to arise when the war ended and the possibility of railway nationalisation came to the fore. It was the closer today because of the large number of Labour Ministers in the National Government. It was gratifying to know that the Chairmen were also looking well ahead, and formulating plans to meet the post-war situation. In a recent article Sir Ronald Matthews, Chairman of the London & North Eastern Railway, warned against the chaos which would arise if a flood of cheap half-used motor vehicles should arise in British transport as it did in 1919.

In connection with transport charges, Sir Osborne Mance had made some suggestions. His proposal was that post-war transport charges should have a two-fold character, first, a toll based on the value of the service principle and representing a contribution to the road-rail pool, and second, a haulage charge based on the prime cost of the service provided. Such proposals, though needing careful examination, were of value as indicating a reasonable line of approach which gave due importance to the nation's interest in the question.

XUM

STAFF AND LABOUR MATTERS

Workmen's Compensation

According to the return (Cmd. 6203) published by the Home Office, workmen's compensation for accidents and industrial diseases amounted, in 1938, to £6,765,067 in the seven great groups of industries—mines, quarries, railways, factories, docks, constructional work, and shipping—which are required to make returns to the Home Office. These groups of industries do not cover the whole field and exclude, in particular, building, road transport, and agriculture, as well as commercial and domestic employments. The total compensation paid in respect of 2,498 fatal accidents was £740,072, and in respect of 456,725 non-fatal accidents, £6,024,995.

The industrial distribution of the payments was as follows: Shipping, £313,969; factories, £2,770,331; docks, £285,900; mines, £2,738,355; quarries, £136,565; constructional work, £241,744; railways, £278,203.

These were the amounts paid to workmen or their dependants and not the total charge on the industries for compensation. To compute the total charge account must be taken of administrative expenses and medical and legal costs of employers, insurance companies and mutual indemnity associations, the amounts placed in reserve and the profits earned by the insurance companies. It is estimated that in the seven great industry groups the total of the compensation paid and all the charges and expenses would amount to about £8,500,000. An approximate estimate of the total charge to all industries and employments put the total at something under £13,500,000.

The amount of compensation averaged over the total number of persons employed in each of the seven industrial groups was in shipping, 40s. 1d.; factories, 9s. 3d.; docks, 51s. 3d.; mines, 68s. 9d.; quarries, 34s. 9d.; constructional work, 17s. 6d.; railways, 12s. 3d. The corresponding figure for all seven industries was 17s. 3d. Under the special schemes for compensation for silicosis and asbestosis the total amount paid in 1938 in 2,739 cases was £230,962.

Control of Labour

The Minister of Labour has made an order making it an offence for an employer in the engineering, building and civil engineering industries to engage labour otherwise than through an employment exchange or by an approved arrangement between an employer and a trade union, and also prohibiting all employers from seeking to engage for other employment men normally employed in coal mining, agriculture, forestry, or horticulture.

In a statement made on June 5, Mr. Bevin dealt with the many problems affecting labour arrangements in wartime. He outlined the arrangements he had made in connection with the supply of labour, and announced that the Factory Department of the Home Office was being transferred to him for the duration of the war. He hoped, in a few days, to announce the creation of an industrial board which would advise him on the employment of women and young persons; the organisation of people to work reliefs so as to keep production going continuously; to deal with billeting in conjunction with the local authorities and with communal feeding, and generally to assist him in grappling with the problems of this big transfer of population. He proposed to work in liaison with the Industrial Research Board so as to have the advantage of its organisation to deal with industrial health and fatigue. He had created a Chief Industrial Commissioner's Department, and proposed to strengthen it in order to have the best possible service to assist him in straightening out difficulties that might arise between the unions and the employers.

On the question of compulsory arbitration for the settlement of industrial disputes where joint negotiating machinery fails to effect a settlement, Mr. Bevin said "I feel that the position should be frankly faced between the consultative committee representing the British Employers' Confederation and the Trade Union Congress and myself. In grappling with this problem I have been very anxious to avoid disturbance of the machinery of negotiation which exists over a wide field of trade and industry in this country. There is nothing quite like it in the world. It is a form of industrial democracy and capable of tremendous expansion, and I am quite satisfied that, in the main, those operating this machinery will, during this period of crisis, act as trustees for the nation and will act with a full sense of responsibility. But I have to have regard to the fact that there may arise differences upon which they may not be able to see eye to eye, or claims upon which they may not be able to agree, and they have accordingly agreed to accept the principle of arbitration for the settlement of disputes which cannot be settled by agreement. The scheme provides for the option of either attaching arbitration to the machinery of the industry or for reference to a national arbitration tribunal. This will be given a period of trial and we will, in the light of its working, review the matter in 1941."

Lodging Allowances

The Ministry of Labour and National Service has announced that workers who are transferred in future by the department to a new area to undertake work of urgent national importance may, in certain circumstances, be entitled to receive lodging and travelling allowances. Lodging allowances, payable by the Ministry, will be given only to a married worker (or an unmarried worker with similar responsibilities) who continues to maintain a home in the town from which he is transferred, and where the employer to whom he is transferred does not pay lodging or similar allowances under customary practice or industrial agreement. The lodging allowances will be at the rate of 3s. 6d. a night (including Sunday) and will be payable only in those cases where the new place of work is beyond reasonable daily travelling distance from the worker's home.

It will be a condition of the payment of lodging allowances that the employer will be responsible for providing certain free fares and for the payment of travelling time at the beginning and end of the job. Employers and workers interested may obtain further information at the Ministry of Labour local offices.

RELAY INTERLOCKING IN PORTUGAL.—The electric relay interlocking plant at Ermezinde station, described in THE RAILWAY GAZETTE for March 17, 1939, page 469, proved so satisfactory that an order was given to the Swedish Ericsson signal concern for another for the Rio Tinto station. The principles of working, signal aspects, and other details, are the same in both plants, but the new layout is smaller. The desk panel apparatus is placed in the station-master's office, and there is no special signal box. It is of exceptionally neat and compact design, the track diagram being formed of plated metal strips with pilot control lamps for the signals, track occupancy, and route locking lamps. Route setting is used, and all signals are light signals. Main supply is a.c. with rectifier-charged accumulators for local d.c. relay circuits, and there is a petrol-electric standby set.

WORKING OF CHOSEN BORDER LINES.—An agreement has now been reached by which the Kamisambo—Seishin section of line on the Manchukuo-Chosen (Korean) border is to revert to the Chosen Government General as from the middle of May, 1940, whereas the Kamisambo—Tumen—Rashin and adjacent branch lines will continue to be worked by the South Manchuria Railway.

Forthcoming Meetings

June 19 (*Wed.*)—**Great Western of Brazil Railway Co. Ltd.** (Ordinary general), River Plate House, 12/13, South Place, E.C., at 2 p.m.

June 20 (*Thurs.*)—**Southdown Motor Services Limited** (Ordinary general), Grand Hotel, Brighton, at 12.30 p.m.

INTERNATIONAL SLEEPING CAR COMPANY.—The annual general meeting of this company, which was to have been held in Paris on June 18, has again been postponed.

RAILWAY AND OTHER MEETINGS

The Antofagasta (Chili) & Bolivia Railway Co. Ltd.

The fifty-second ordinary general meeting of the Antofagasta (Chili) & Bolivia Railway Co. Ltd. was held at Winchester House, London, E.C., on June 11. Mr. A. W. Bolden, Chairman and Managing Director of the company, presided.

The Secretary, Mr. C. Cowley, having read the notice convening the meeting and the report of the auditors,

The Chairman opened his speech by referring to the great loss the company had suffered by the death of Sir Bernard Greenwell, who had been a director for nearly 35 years.

The results of the company's operations for 1939 again had been disappointing because a decrease in gross receipts of £23,000 had been made worse by an increase in the working expenses of £37,000, so that the net receipts from the operations of the railway and waterworks were £60,000 less than for the previous year. From the working of the railway, the gross receipts were £27,000 less, offset by an increase in the receipts from the waterworks and resulting in the decrease of £23,000 in round figures.

The explanation of the falling off of 3 per cent. in gross receipts notwithstanding an increase of 6 per cent. in the total tonnage of goods traffic handled was mainly to be found in the lesser quantities carried of up traffic such as machinery and the various articles required by the mining industry in Chile and Bolivia and in fuel oil and coal traffics carried to the interior which produced more revenue than, for example, the down traffics in low grade minerals and nitrate, the latter a relatively short haul.

On the Chilian section the total goods tonnage had been almost identical, not quite 1 per cent. less, and on the Bolivian section it had been 6½ per cent. more. For the whole railway, analysis of the principal items showed increases in nitrate, tin, sulphur, general merchandise, cereals and sugar, with decreases in copper bars from the Chile Exploration Company, blends from the Huanchaco Company, mining articles, coal, and fuel oil.

Passenger traffic for the Chilian section was less by almost 10 per cent. but gave slightly higher receipts in sterling because the conversion of the peso into sterling had been favourable for the peso. In Bolivia, both numbers and receipts had been more. The average distance travelled had been greater and the company had the benefit of the surcharges arranged with the Bolivian Government in the latter half of 1938, for the full year instead of only a part of the year, and a 10 per cent. increase which came into operation as from November 3, 1939.

The ratio of expenditure to gross receipts was 81·88 per cent. compared with 74·42 per cent., mainly the result of the increased contributions to renewals charged directly to working. It might have been possible to reduce expenditure had one or two factors such as increased labour costs not occurred to offset savings. Salaries and wages constituted some 46 per cent. of the company's total expenditure. Local taxation and contributions under the social laws accounted for a substantial amount of materials of all descriptions used by a railway and coal and oil fuel represented the bulk of the remaining expenditure. All items of materials had risen in price and were continuing to do so.

The waterworks had fortunately made a better showing than in the previous year, the net surplus having been just over £6,000, as compared with only £500.

Dealing with the debenture scheme, the Chairman said that by realisation of the greater part of the company's investment in Andes Trust and of its general investments, it had liquidated a liability of some £2,200,000 and reduced by rather more than £100,000 the annual charge for interest on the debenture stocks.

At the conclusion of his speech the Chairman invited questions from shareholders. Mr. Barnabas Russell commenced to criticise the board and the accounts, but the meeting refused to hear him.

The report and accounts were adopted, the retiring directors re-elected, and the auditors re-appointed. The proceedings concluded with a vote of thanks to the chairman, directors, and staff.

PARLIAMENTARY NOTES

Railway Companies and Superannuation Schemes Bill

During the debate on the motion for the Second Reading of the Superannuation Schemes (War Service) Bill on June 4, Mr. F. C. Watkins (Hackney Central—Lab.) asked how railway superannuation funds would be affected. He said that in the Schedule there was a list of persons to whom the Measure would not apply. They were mostly people in the Civil Service, and the local government service, and they were all members of statutory superannuation schemes. The railway clerical, supervisory, and technical employees also belonged to statutory superannuation schemes, but they were not mentioned specifically in the Bill. He realised that it was unlikely that servants of railway companies, in clerical, supervisory, and administrative capacities, would be transferred in any large number to other industries. The railway companies were carrying on their undertakings with the very minimum of staff. When they considered the strain which had been imposed on the Southern Railway in bringing the men of the B.E.F. back from the south-east coast during the last few days, and performing that task so successfully, it was obvious that no great deduction could be made from the staffs of the railway companies. He would like the Minister to say whether the Bill would affect the statutory railway superannuation funds, and, if so, in what way.

Mr. R. Assheton (Parliamentary Secretary to the Ministry of Labour & National Service) said railway companies were not among those exempted under the Schedule, and, therefore, they were covered by the Bill itself and were able to take advantage of its provisions.

The purpose of the Bill, which was given a Second Reading, is twofold. It is designed, in the first place, to enable trustees and others concerned with administering superannuation schemes to prevent loss of rights under a scheme which might otherwise result from employees going into the Armed Forces or into civil employment for war purposes. Secondly, it is to enable the payment of contributions to be continued on behalf of persons after they have left the unemployment to which the scheme relates.

The Committee stage of the Bill was completed on June 5, and it was read a third time.

Question in Parliament

Railway Staffs

Mr. G. Le M. Mander (Wolverhampton—Lib.), on June 5, asked the Minister of Transport if he would consider the advisability of making an arrangement by which members of the salaried staff of railway companies who, in the ordinary course, would retire at the age of 60, shall continue or resume their service in the present emergency, with a view to making the fullest possible use of man-power.

Sir John Reith (Minister of Transport): The railways are already retaining or re-employing men who have passed the normal retiring age if their services are required and they are physically fit and efficient.

Mr. Mander: Has the Minister taken into account the fact that these men are under contract in respect of their superannuation, and has he had consultation with the Railway Clerks' Association, which represents the great majority of them?

Sir John Reith: I will look into that point, and if consultations have not taken place they will.

Forthcoming Events

June 15 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at Southport. "Oxygen cutting," by Mr. R. E. Dore.

June 28 (*Fri.*).—Railway Benevolent Institution, at Room C, Euston station, L.M.S.R. 4 p.m. Eighty-second annual meeting.

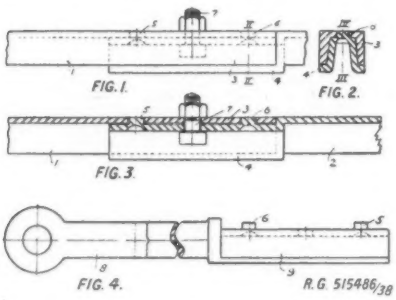
XUM

ABSTRACTS OF RECENT PATENTS*

No. 515,486. Point and Signal Rodding

Walter Sydney Roberts, of "Newby," Ruff Lane, Ormskirk, Lancashire, and the Broadway Signal Co. Ltd., of 40, Broadway, Westminster, London, S.W.1. (*Application date: June 1, 1938.*)

The end 4 of one channel rodding section 2 is shaped to fit within the end 3 of an adjacent channel rodding section 1, this end 4 being provided with studs 5, 6 which engage corresponding holes in the base of the

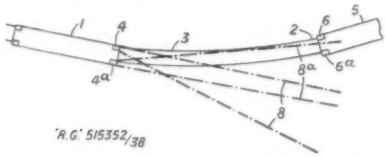


channel of the end 3. These studs 5, 6 are preferably formed by pressing or stamping. A bolt 7 merely serves to prevent transverse relative movement of the sections 1, 2. Fig. 4 shows the device applied to a rodding section 8 with a channel section end 9. Several other applications are described and illustrated.—(*Accepted December 6, 1939.*)

No. 515,352. Safety Apparatus

Alfred Ernest Le Rossignol (Colonel), C.B., M.Inst.C.E., M.I.E.E., of Aldershot Lodge, Aldershot, Hampshire. (*Application date: May 26, 1938.*)

As applied to Tube trains, for instance, the rear end of a train 1 on the curve 3 of track 2, is provided with lamps, such as white light or infra-red

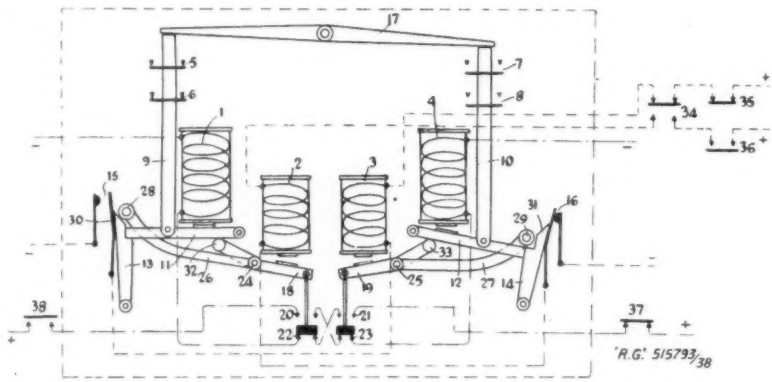


ray lamps 4, 4*a*. The front end of an approaching train 5 is provided with cells 6, 6*a* which are sensitive to the radiation of the lamps 4, 4*a* and serve to operate an electric relay for a signal or for brake operation. By adjusting the intensity of the radiation beams 8, 8*a* and the sensitivity of the cells 6, 6*a* it is possible to arrange that the signal or brake relay is operated when train 5 gets within a dangerous distance of train 1. Moreover, by adjusting the deviation of the beams 8, 8*a*, the device may be suited to any curve of track which may be encountered.—(*Accepted December 4, 1939.*)

No. 515,793. Signalling

The Siemens & General Electric Railway Signal Co. Ltd., of Caxton House, Tothill Street, Westminster, London, S.W.1, Arthur Joseph Golding, of 113, Draycott Avenue, Kenton, Harrow, Middlesex, and Frank Horler, of the Siemens & General Electric Railway Signal Co. Ltd., East Lane, Wembley, Middlesex. (*Application date: June 10, 1938.*)

As applied to the operation of railway points, a relay has two coils 1, 3 for the normal operation, co-operating with contacts 5, 6, and two coils 2, 4 for reverse operation, co-operating to operate contacts 7, 8. The coils 2, 3

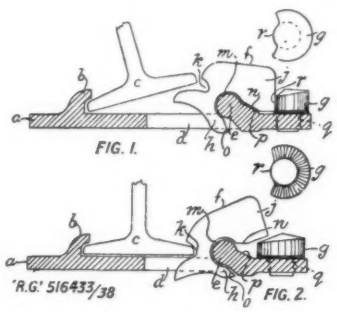


are adapted to be energised through interlocking circuits, and the coils 1, 4 are adapted to be energised through track and/or detector control circuits. A bar 9 connected to the armature 11 of coil 1 is adapted to close contacts 5, 6 when coil 1 is energised, and contacts on a similar bar 10 connected with armature 12 are adapted to close contacts 7, 8 when coil 4 is energised, each bar being locked in its raised position by a pawl 13 or 14, respectively, associated with spring contacts 15 or 16, respectively. Lever 17 prevents simultaneous closing of contacts 5, 6 and 7, 8. The coils 2, 3 act on armatures 18, 19, respectively, to close contacts 20 or 21, respectively, and open contacts 22 or 23. Each of these armatures 18, 19 is pivoted on pins 24, 25 also pivoting levers 26, 27, each of which has a roller 28 or 29 acting on the surface 30 or 31 to close contacts 15 or 16, under the action of a pin 32 or 33 on an extension of the armature 18 or 19. The control key 34 has a normal position, including the contacts 35 operated by points or signals which may conflict points or signals operated by contacts 5, 6, and a reverse position including interlocking contacts 36. Contacts 37 in the circuit of coil 1, and similar contacts 38 in the circuit of coil 4, which may be in the circuit of a track relay, are arranged to open the circuit when the points are fouled by a train.—(*Accepted December 14, 1939.*)

No. 516,433. Rail Chairs

Juan Ferrari (Ivani), of 152, Coimas Street, San Felipe, Chile, South America. (*Application date: June 21, 1938.*)

Fig. 1 shows how a rail *c* is lowered into position, as illustrated in Fig. 2, between a fixed jaw *b* and a moving jaw *F* of a chair *a*. The jaw *F* is fulcrumed in a slot *d* in the chair base by means of a bulbous headed lug *e* integral with the base, and is in the form of a lever with a tail piece *h* and a head *j*. Thus the jaw may consist of a block with a groove *k* in one side and a recess *m* to engage the lug *e*. The opposite sides *n*, *o* of the recess *m* are spaced to permit movement of the jaw *F* to release the rail



when desired, the face *n* contacting a flat surface *p* on the chair when in the released position. A latch for securing the jaw *F* consists of a beaded stud *g* journalled in a hole *q* and having its head cut-away at *r*, so that rotation

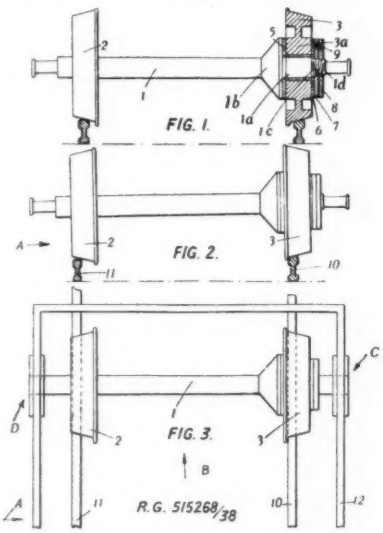
* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each

of the stud *g* according to its final position permits the jaw *F* to be released or not, as indicated by the details in Fig. 1.—(*Accepted January* 2, 1940.)

No. 515,268. Wheel and Axle Assemblies

Ernest Hutchinson, of 2, *Westfield Grove, Gosforth, Newcastle-on-Tyne* 3, *England.* (*Application date: May* 27, 1938.)

In a wheel and axle assembly in which the wheels are capable of relative rotation, one wheel 2 is rigidly mounted on the axle 1, whilst the other wheel 3 has its bushed hub 3*a* mounted on a journal 1*a*, axial thrust

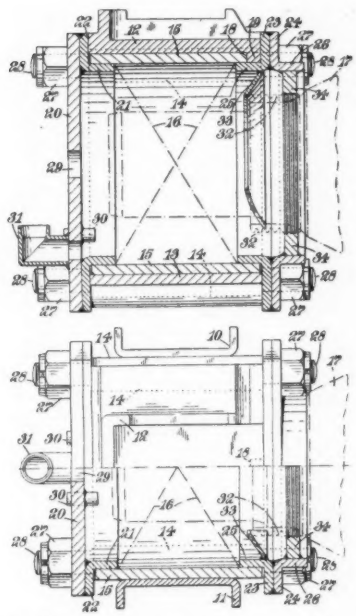


being taken up by a shoulder 1*b* of the same diameter as the free wheel hub 3*a*. A "brass," ball or roller thrust washer 5 is inserted between the shoulder 1*b* and the hub 3*a*, and the outer end of the journal 1*a* is reduced in diameter to form a shoulder 1*c* abutting against a retaining washer 6 which may be of similar form to the washer 5. A retaining nut 7 is screwed on the portion 1*c*, and this nut is tapped to receive a locking screw 9 which passes through a hole in a locking nut 8 screwed on to a further reduced portion 1*d* with the opposite thread to the portion 1*c*. Figs. 2 and 3 show the result of windage in the direction of arrow A, 10 being the lee rail and 11 being the windward rail, and the arrow B indicating the direction of travel. Arrows C and D indicate pressure between the axle 1 and bogie frame 12.—(*Accepted November* 30, 1939.)

No. 512,843. Axleboxes

William Sebastian Graff Baker, of 4, *Edwardes Square, Kensington, London, W.*8, *and London Passenger Transport Board, of* 55, *Broadway, Westminster, London, S.W.*1. (*Application date: March* 18, 1938.)

An axlebox for a railway vehicle consists of two side frames 10, 11, an upper frame 12 and a lower frame 13,

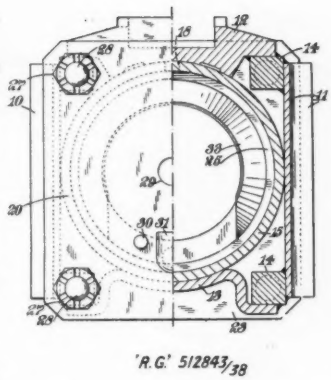


having four corner pieces 14. Inside this frame is a tube 15 carrying an anti-friction bearing 16 and axle 17, and cut away at 18 to receive a projection 19 to prevent rotation of the tube. The front end of the axlebox is closed by a cap 20 with an annular flange 21 to form an abutment for the anti-friction bearing 16, this flange forming part of an L-section pressing the base 22 of which abuts against the cap 20. The rear end of the axlebox has a cap of two pressings, 23, 24 with flanges 25, 26. Nuts 27 on threads 28 secure the front and rear caps. An aperture 29 which may be used to locate a thrust pad is provided in the cap 20. Pegs 30 may be used to check rotation of the thrust pad and a lubricant filler 31 is provided. Shrunk upon the axle 17 is a sealing ring 32 externally corrugated to provide oil-throwing edges, and a ring 33 and closure ring 34 are provided.—(*Accepted September* 27, 1939.)

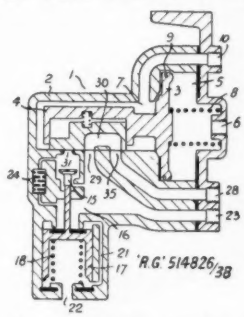
No. 514,826. Fluid Pressure Brakes

Westinghouse Brake & Signal Co. Ltd., Arthur Greenwood Kershaw, and Arthur William Simmons, all of 82, *York Way, King's Cross, London, N.*1. (*Application date: May* 5, 1938.)

An emergency application valve device 1 for effecting the supply of fluid under pressure from an emergency reservoir to brake cylinders in the event of pressure reduction in the emergency brake pipe, consists of a casing 2 with piston 3, connected to a slide valve 4, and dividing the casing into a piston chamber 5 in communication with an emergency brake pipe through passage 6, and a slide valve chamber 7 in communication with emergency reservoirs through passage 10. A spring 8 normally holds the piston 3 in the position shown, opposite sides of the piston communicating



by a groove 9 in the casing. The brake cylinder is in communication through a passage 23 with chamber 16, above a valve piston 17 pressed by a spring 18 so that an inshot valve member 15 is normally open. Chamber 16 normally communicates with port 35 and passage 28 through port 29 and cavity 30 in the slide valve 4, the passage 28 leading to the control pipe of the brake. When pressure falls in the emergency control pipe the piston 3 and slide valve 4 move to the right



so isolating the brake cylinder passage 28 and opening port 31 so that fluid flows from emergency reservoir to brake cylinder by passage 10 and passage 23, and through restricted by-pass 24. Terminal brake cylinder pressure, determined by spring 18, closes the valve 15. The piston 17 is subjected to atmospheric pressure through passages 21, 22. Modifications are illustrated.—(*Accepted November* 20, 1939.)

COMPLETE SPECIFICATIONS ACCEPTED

512,895. Standard Telephones & Cables Limited, Griffiths, J. B., and Brown, A. Railway signal and/or points control systems.

512,917. Westinghouse Brake & Signal Co. Ltd., and Simmons, A. W. Vacuum braking-apparatus.

512,997. Spencer Moulton & Co. Ltd., G., and Glascodine, R. T. Bogies for vehicles.

513,240. British Boiler Accessories Limited, and Goldstern, W. Steam accumulators.

513,335. Bosch Ges., R. Control valves for fluid-pressure brakes of trains.

513,515. General Railway Signal Co. Ltd. Railway-track switch and signal control.

XUM

NOTES AND NEWS

Reserved Occupations Schedule.—The revised schedule of reserved occupations, issued on June 8, raises from 25 to 30 the age at which railway clerks are reserved. The change is effective from August 1 next.

Floods in Western Roumania.—A press message from Bucharest says that the Simplon-Orient Express and numbers of other trains have been held up by extensive floods in Western Roumania, caused by a series of cloudbursts in South-East Europe during the past fortnight.

Temiscouata Railway Bondholders Committee Limited.—According to particulars received from the head office at Riviere du Loup, gross earnings of the Temiscouata Railway in March were $12,788 compared with $14,608 in March, 1939. Operating expenses were $15,630 against $18,534.

Road Accidents in May.—The return of the numbers of persons reported to have died in Great Britain during May as the result of road accidents shows a total of 449. This compares with 553 in May, 1939, and with 451 in April last. Adult pedestrians killed numbered 150 last month against 127 in May, 1939; 77 of these fatalities occurred during the hours of darkness. Motor cyclists killed numbered 51, which compared with 85 a year earlier; in the case of pillion passengers, the figure declined from 30 to 7.

Mogyana Railway Bonds Redemption.—The Mogyana Railways Company is offering to purchase three series of the company's sterling bonds for redemption at the price of £34 10s. for each £100 bond. The bonds in question are the Sul Mineira Extensions first mortgage 5 per cent. (1911); the first mortgage 5 per cent. (1914); and the first mortgage 6 per cent. (1927). The price proposed to be paid for all these bonds is £1,254,834. Of this total, £350,000 is to be paid within three months of approval of the scheme, and the balance by monthly instalments of not less than £75,000 each. Meetings of the bondholders concerned have been convened for Thursday, June 20, at Winchester House, Old Broad Street, E.C.

The Peloponnesus Railway, Greece.—The Athens correspondent of *The Times* states that a law has been published which provides for the liquidation of the Piræus, Athens & Peloponnesus Railway Company. A liquidator has been appointed and the Hellenic State Railways have taken over the working of the line pending the realisation of the assets. This railway owns 815 km. (506 miles) of metre-gauge line. According to the latest available return, its rolling stock consists of 100 locomotives, 300 carriages, 1,150 wagons, 16 railcars, and 4 trailers. It is the largest private railway in Greece.

Argentine Railway Earnings.—The gross earnings of the Argentine railways (including the State system) for the first seven months (July-January) of the financial year 1939-40, amounted to 286,692,000 pesos, or 4,713,000 pesos (1·7 per cent.) more than in the corresponding period of the preceding financial year. The British-owned railways receipts accounted for 202,973,000 pesos of the total, an increase of 2,096,000 pesos, or 1 per cent. Goods revenue for the whole system amounted to 201,050,000 pesos, or 3 per cent. more than in 1938-39, and passenger receipts were 55,918,000 pesos, or 0·7 per cent. less. Goods tonnage totalled 25,751,000, or 4 per cent. more, and the number of passengers was 96,943,000, a small increase of 1·1 per cent.

Controlled Undertakings.—The Ministry of Supply on June 10 issued the Control of War Production (No. 1) Order, 1940, under which some 1,500 firms are declared controlled undertakings. The names of these firms will not be published, but a letter has been sent to every firm concerned informing it that it is a "controlled undertaking." Those firms will be subject to directions issued by or on behalf of the Government department for which they are working, usually the Admiralty, the Ministry of Aircraft Production, and Ministry of Supply. Directions have already been given to such firms to continue with their work in accordance with existing arrangements until they are instructed otherwise. It is hoped by the Ministry of Supply that firms will refrain for the present from making enquiries relating to the method of control.

Irish Traffic Returns

IRELAND		Totals for 22nd Week			Totals to Date		
		1940	1939	Inc. or Dec.	1940	1939	Inc. or Dec.
		£	£	£	£	£	£
Belfast & C.D. (80 miles)	pass.	2,751	2,697	+ 54	52,074	41,412	+ 10,662
	goods	564	456	+ 108	10,653	9,511	+ 1,142
	total	3,315	3,153	+ 162	62,727	50,923	+ 11,804
Great Northern (543 miles)	pass.	10,600	12,450	− 1,850	224,050	200,250	+ 23,800
	goods	15,550	10,500	+ 5,050	260,200	224,800	+ 35,400
	total	26,150	22,950	+ 3,200	484,250	425,050	+ 59,200
Great Southern (2,076 miles)	pass.	34,286	43,295	− 9,009	685,333	675,660	+ 9,673
	goods	42,068	34,395	+ 7,673	975,665	906,805	+ 68,860
	total	76,354	77,690	− 1,336	1,660,998	1,582,465	+ 78,533
L.M.S.R. (N.C.C.) (271 miles)	pass.	5,250	5,240	+ 10	98,230	76,170	+ 22,060
	goods	3,940	2,820	+ 1,120	77,670	65,010	+ 12,660
	total	9,190	8,060	+ 1,130	175,900	141,160	+ 34,720

British and Irish Railway Stocks and Shares

Stocks	Highest 1939	Lowest 1939	Prices June 11, 1940	Prices Rise/Fall
G.W.R.				
Cons. Ord.	38	21¼	31	+1¼
5% Con. Pref.	92	71	79½	−2
5% Red. Pref. (1950)	98	83	99½	−1
4% Deb.	103	91	96	—
4½% Deb.	105½	93¾	100½	—
4½% Deb.	110	99	102½	—
5% Deb.	121	109⅛	113½	−2
2½% Deb.	63½	54	59	—
5% Rt. Charge	117	104	108	—
5% Cons. Guar.	111	96⅛	101	−2
L.M.S.R.				
Ord.	17	9¼	13	+1
4% Pref. (1923)	46½	20	30	—
4% Pref.	63½	37½	46	—
5% Red. Pref. (1955)	83	58½	70½*	−7
4% Deb.	98½	85	85½*	+½
5% Red. Deb. (1952)	109	101¼	105	—
4% Guar.	87⅛	73	73½	+2
L.N.E.R.				
5% Pref. Ord.	5⅜	3½	3	−¼
Def. Ord.	3½	1⅜	2	+¼
4% First Pref.	38½	19	26	—
4% Second Pref.	15	7⅜	9	—
5% Red. Pref. (1955)	55	38	49¼	−3
4% First Guar.	78½	60	63	−1½
4% Second Guar.	68⅜	47	50½	+2
3% Deb.	71⅛	57	59½*	+1½
4% Deb.	93	76	80*	+½
5% Red. Deb. (1947)	106⅛	98	100	—
4½% Sinking Fund Red. Deb.	104½	96	99½*	−½
SOUTHERN				
Pref. Ord.	78	46½	44	+1½
Def. Ord.	19¼	7	9½	+½
5% Pref.	100	76	79½	−3
5% Red. Pref. (1964)	102⅞	94	100½	—
5% Guar. Pref.	116½	103	105	—
5% Red. Guar. Pref. (1957)	112⅝	102⅛	104	—
4% Deb.	103	91¼	90½*	−2½
5% Deb.	118½	109½	112½*	−3
4% Red. Deb. (1962–67)	106	98	99*	−1
4% Red. Deb. (1970–80)	102	96	98*	−1½
FORTH BRIDGE				
4% Deb.	98⅛	81	92½	—
4% Guar.	95	80	87½	−3½
L.P.T.B.				
4½% "A"	115	103	105	—
5% "A"	123	106½	109	—
4½% "T.F.A."	105	100⅛	102	—
5% "B"	117½	102	104½	—
"C"	84	63⅜	32½	−3
MERSEY				
Ord.	24½	17½	20½	−3
4% Perp. Deb.	93⅜	88½	91	—
3% Perp. Deb.	77	65½	60½	−5
3% Perp. Pref.	55	49½	54½	—
IRELAND				
BELFAST & C.D.				
Ord.	6	3	4	—
G. NORTHERN				
Ord.	6	2½	4	—
G. SOUTHERN				
Ord.	13½	8	9	−¼
Pref.	26	10	22½	—
Guar.	40½	22	29	—
Deb.	57	45⅜	51½	−¼

* ex dividend

RAILWAY AND OTHER REPORTS

Great Western of Brazil Railway Co. Ltd.—Gross receipts for the year 1939 amounted to £482,779, an increase of £61,921 or 14·71 per cent. in comparison with 1938. Working expenses were, at the same time, reduced by £9,771 or 2·43 per cent. to £392,487, leaving net receipts £71,692 higher, at £90,292. After crediting interest and deducting debenture and other charges, there is a deficit for the year of £22,113, although the £18,375 interest for the year on the £306,250 of permanent 6 per cent. debenture stock is fully covered. Interest and sinking fund charges on the outstanding £1,206,900 in 4 per cent. debentures required £85,899. Currency receipts were the highest on record.

B.E.T. Electricity Supply Co. Ltd.—This subsidiary of the British Electric Traction Co. Ltd. reports a net profit for the year to March 1, 1939, of £45,705 (£46,828). The dividend recommended is again 4 per cent. and the amount carried forward is £27,499, against £23,915 brought in.

National Electric Construction Co. Ltd.—This subsidiary of the British Electric Traction Co. Ltd. returns a profit for the year 1939 of £40,130 after tax. The Dewsbury & Ossett Tramway reserve receives £2,304, a dividend of 10 per cent. is again proposed, and £19,326 is placed to undivided profits account, raising it to £129,363.

Hants & Dorset Motor Services Limited.—This company is a subsidiary of Tilling & British Automobile Traction Limited and the Southern Railway Company, and for the year to March 31, 1940, reports net profit, after tax, of £71,496 which compares with £68,545 for the previous year. The directors recommend a final ordinary dividend of 5¼ per cent., tax free, making 9¼ per cent. for the year against 10 per cent. for the previous year. There is allocated to reserve £5,000, against £2,000, and the carry forward is £24,158, against £20,038 brought in.

Algoma Central & Hudson Bay Railway Company & Algoma Central Terminals Limited.—The report of the bondholders' committee for the year 1939 states that the results of the year's working, after depreciation for 1939 and also $58,653, balance of deferred depreciation for 1934, but before debiting the terminals' rent and interest on unpaid rent, were : receipts, $2,008,629 (against $1,779,459 for 1938) ; expenses, $1,917,518 ($1,691,682) ; profit $91,110 ($87,777). The profit is not sufficient to cover payment of interest either on the terminals or on railway securities.

Southdown Motor Services Limited.—For the year ended March 31, 1940, this company, which is controlled jointly by the Southern Railway Company and Tilling & British Automobile Traction Limited, secured a gross revenue of £1,089,280, compared with £992,983. After deducting £567,942 (£586,383) for operating and maintenance expenses, £250,654 (£165,527) for Road Act duties, rates, and taxes, £132,652 (£135,807) for depreciation, and other items chargeable against revenue, there remains a profit of £124,611 (£99,863), to which must be added £23,890 brought forward, making a total of £148,501, compared with £118,890 for the previous year. It is proposed again to place £20,000 to reserve, to repeat the dividend at 10 per cent., absorbing £75,000, and to carry forward £53,501.

Alabama Great Southern Railroad Company.—Gross operating revenue for the year 1939 amounted to $7,677,582, an increase of $881,349. In freight revenue there was an increase of $917,540, but in revenue from passenger traffic there was a decrease of $50,699. Operating expenses and taxes showed an increase of $337,644. Net income after all charges amounted to $2,111,051, an improvement of $614,872. Dividends aggregating $8 a share ($50) were paid, and the amount carried forward was $13,477,650.

New York, Ontario & Western Railway Company.—This company, a subsidiary of the New York, New Haven & Hartford Railroad, earned in 1939 operating revenues of $6,014,157, a decrease of $425,498. The operating expenses of $5,519,525 showed a reduction of $454,631. After providing for tax accruals and equipment and joint facility rents, there was a net railway operating deficit of $496,674 against $599,496. The overall net deficit was $1,882,784 compared with $1,994,314.

Forestal Land, Timber & Railways Co. Ltd.—Net profit for the year 1939 was £495,128, compared with £326,971 for 1938 ; £80,000 (against £11,579) is placed to taxation reserve and £123,355 (against nil) to general reserve. The amount brought in was £132,557. The 6 per cent. dividend on the cumulative preference shares absorbs £111,951, and £125,000 is transferred to dividend equalisation account. A final dividend of 3 per cent. less tax and bonus of 3 per cent. less tax, which, with the interim of 3 per cent., makes a total of 9 per cent. less tax (same), takes £211,404, and £179,330 is carried forward.

Northern Pacific Railway Company.—The average mileage operated in 1939 was 6,721 miles. Railway operating revenues totalled $63,882,432, an increase of $6,860,848, and operating expenses advanced by $2,622,999 to $49,679,727, making a reduction in the operating ratio from 82·52 per cent. to 77·77 per cent. Net railway operating income, at $10,479,237, showed an improvement of $4,181,879, and gross income advanced by $4,267,391 to $14,827,848. Fixed charges required $14,495,411. Net income for 1939 was $73,653, as compared with a net deficit of $4,322,413 in 1938.

Callender's Cable & Construction Co. Ltd.—The directors have recommended a final dividend of 10 per cent. less tax for 1939, making 15 per cent. for the year (same).

Chloride Electrical Storage Co. Ltd.—The directors recommend a final dividend on the "A" and "B" stock of 5 per cent. and a bonus of 5 per cent., making 15 per cent. (same) for the year to March 31, 1940.

Beyer Peacock & Co. Ltd.—The directors are paying 2¾ per cent. less tax on July 20 off dividend arrears on the 5½ per cent. preference capital. The payment to be made is in respect of the half year to December 31, 1931.

J. Stone & Co. Ltd.—The directors report a profit for the year 1939 of £204,012 and recommend a dividend of 25 per cent. on the ordinary shares. For 1938 profits were £208,678 and the ordinary dividend was 27½ per cent. The amount carried forward is £231,986 against £217,073 brought in.

Sentinel Waggon Works (1936) Limited.—The directors, on July 1, are paying 6 per cent., less tax, off arrears of dividend on the 6 per cent. preference shares. This brings the payment up to December 31, 1939. A dividend of 12 per cent. was paid in December last on these shares to December 31, 1938, leaving arrears from January 1, 1939.

Contracts and Tenders

The Peruvian Corporation has placed substantial orders for lubricants with the following firms :—

C.C. Wakefield & Co. Ltd.
Vacuum Oil Co. Ltd.
International Petroleum Distributors Ltd.
Texas Oil Co. Ltd.
Graphite Products Limited.

The Bengal-Nagpur Railway has placed an order with C. Clifford & Son Ltd. for metallising brass and copper wire, and with J. Spencer & Sons (1928) Ltd. for 150 spiral springs.

It is reported that the Indian Railway Board is proposing to order 1,500 new wagons at an estimated cost of Rs. 75,00,000.

The Inland Steel Company of the U.S.A. has received an order for 25,000 tons of rails, value $2,000,000, for the Rio Grande do Sul Railway, Brazil. According to Reuters, a five-year U.S. export and import bank credit has been arranged.

The Municipal Water Department, Singapore, is calling for tenders for the supply and delivery of pumping plant for the MacRitchie Reservoir. Tenders endorsed "Tender for the Supply of Pumping Plant" are receivable by the Municipal Secretary up to 12 noon, September 16, 1940 (D.O.T. No. T. 20241/40).

XUM

Railway Stock Market

Italy's declaration of war had no important repercussions on the City. Quotations for all classes of securities were lowered and widened as a precautionary measure, but no heavy selling developed, and subsequently the reduced prices attracted buyers under the lead of gilt-edged securities. General realisation that, influenced by exaggerated fears as to possible air-raid damage, debentures and guaranteed stocks of the home railways had been reduced to low levels, resulted in a slightly better tendency in many securities of the main-line companies. There was, however, little improvement in demand, and the better prices arose mainly from the fact that there is now little pressure to sell at current prices. When there is a general rally on the Stock Exchange, home railway securities will be expected to participate, but at the present time, owing to the small amount of business passing, prices are quoted with wide margins between the nominal buying and selling limits. Sentiment has been assisted to some extent by the knowledge that the dividend on L.M.S.R. 5 per cent. redeemable preference stock is to be paid, although there were, of course, no fears that this payment would not be made. The company's 4 per cent. senior preference stock ranks *pari passu* with the redeemable preference, and as in the case of other home railway preference issues, it is now being widely recognised that prices are at unduly low levels and that, all factors considered, the yields offered must be regarded as very attractive. There is, however, a disposition in many quarters to await the decisions as to interim dividends on stocks of the ordinary class, which are due, in a few weeks, because the interim statements may enable the position and outlook to be more clearly assessed. The interim decisions may have an important bearing on the junior stocks, but there is, of course, no doubt that, judged by other high-grade investment stocks, home railway debentures and prior charge securities are moderately priced.

L.M.S.R. ordinary, which was quoted at 12 a week ago, has since improved a point, and at 46½ the senior preference showed a similar improvement on balance. The 5 per cent. redeemable preference was 70½ xd., while the 4 per cent. 1923 preference was fractionally better at 30½. The guaranteed stock rallied from 71½ to 74; the 4 per cent. debentures were unchanged at 86 xd., and the 5 per cent. debentures remained at 105. Great Western ordinary was 31, which compares with 29½ a week ago, but the 5 per cent. preference showed a further decline from 80½ to 78½. On the other hand, an improvement from 94 to 96 was recorded in the 4 per cent. debentures.

As regards Southern issues, the preferred attracted some attention, and at 45 was three points above the price current a week ago, and at 9½ the deferred stock recorded a fractional rise. Nevertheless the 5 per cent. preference was 78½ (compared with 82 a week ago) and is at the same level as the equivalent preference stock of the Great Western. Southern 4 per cent. debentures were 91 xd.; a week ago they were 93.

There was a firmer tendency in L.N.E.R. guaranteed stocks, which in recent weeks have suffered a heavy fall. The first guaranteed was 65, compared with 63½ a week ago, and the second guaranteed 50, compared with 48½. Moreover, the first preference was a point higher at 26½, and the second preference remained at 9. L.N.E.R. 3 per cent. debentures rallied from 58 to 59½ xd., but the 4 per cent. debentures were unchanged at 79½ xd.

Argentine railway securities moved lower in the absence of demand, including the debentures, the decline in which has no justification other than the prevailing trend on the Stock Exchange. French railway sterling bonds were again marked down.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1939–40	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1939	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1939	Prices: Lowest 1939	Prices: June 11, 1940	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	2.6.40	23,190	+ 10,250	22	420,490	293,730	+ 126,760	Ord. Stk.	10⅝	4½	5	Nil
	Argentine North Eastern ...	753	1.6.40	ps. 169,500	– ps. 11,500	49	ps. 7,390,000	ps. 7,702,000	– ps. 312,000	,,	4½	2	2	Nil
	Bolivar	174	May 1940	4,410	– 540	22	20,650	20,300	+ 350	6 p.c. Deb.	7½	5⅛	7	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	5⅛	4½	6	Nil
	Buenos Ayres & Pacific ...	2,801	1.6.40	ps.1,203,000	–ps.218,000	49	ps.66,894,000	ps. 69,928,000	–ps. 3,034,000	Ord. Stk.	5½	2	2½	Nil
	Buenos Aires Central ...	190	27.4.40	$89,900	– $1,700	44	$4,183,000	$4,363,400	– $180,400	Mt. Deb.	14	8	13½	Nil
	Buenos Ayres Gt. Southern	5,082	1.6.40	ps.1,990,000	– ps.35,000	49	ps.112,634,000	ps. 113,053,000	– ps. 419,000	Ord. Stk.	13⅜	4½	5½	Nil
	Buenos Ayres Western ...	1,930	1.6.40	ps. 647,000	–ps.113,000	49	ps.37,793,000	ps. 36,687,000	+ps. 1,106,000	,,	10½	4	4½	Nil
	Central Argentine	3,700	1.6.40	ps.1,603,000	–ps.629,750	49	ps.84,855,950	ps. 93,855,650	–ps. 8,999,700	,,	11¼	4	4½	Nil
	Do:	—	—	—	—	—	—	—	—	Dfd.	4	1½	3	Nil
	Cent. Uruguay of M. Video ...	972	1.6.40	22,482	+ 2,479	49	1,044,092	909,861	+ 134,231	Ord. Stk.	2½	7/8	1½	Nil
	Costa Rica	188	Mar. 1940	22,121	– 1,348	40	158,217	200,680	– 42,463	Stk.	24½	18	22	9½
	Dorada	70	May 1940	13,000	– 1,500	22	59,100	66,800	– 7,700	1 Mt. Db.	104½	102	102½	5⅝
	Entre Rios	810	1.6.40	ps. 263,500	– ps. 27,400	49	ps.11,440,900	ps.12,311,100	– ps. 870,200	Ord. Stk.	6	3	2½	Nil
	Great Western of Brazil ...	1,016	1.6.40	6,100	+ 300	22	247,800	209,900	+ 37,900	Ord. Sh.	3/–	1/2½	7/8	Nil
	International of Cl. Amer. ...	794	Apl. 1940	$581,298	+ $46,789	17	$2,343,432	$2,284,653	+ $58,779	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	7½d.	7½d.	¼	Nil
	La Guaira & Caracas	22¼	May 1940	6,660	– 280	22	34,675	28,640	+ 6,035	Stk.	7	6½	6¼	Nil
	Leopoldina	1,918	1.6.40	22,755	+ 7,198	22	481,334	413,128	+ 68,206	Ord. Stk.	2½	¼	1½	Nil
	Mexican	483	30.4.40	$473,500	+ $26,900	17	$5,385,700	$5,529,400	– $143,700	,,	1⅛	¼	⅛	Nil
	Midland of Uruguay	319	Apl. 1940	12,921	+ 6,073	44	106,712	89,923	+ 16,789	,,	2/–	¼	¼	Nil
	Nitrate	386	31.5.40	5,203	+ 2,594	21	75,112	51,279	+ 23,833	Ord. Sh.	2½	1½	1⅞	6½
	Paraguay Central	274	1.6.40	$3,171,000	– $370,000	49	$153,946,000	$151,303,000	– $2,643,000	Pr. Lt. Stk.	45½	36	40	15
	Peruvian Corporation ...	1,059	May 1940	69,707	+ 14,276	48	750,190	726,081	+ 24,109	Pref.	1 7/8	7/8	2	Nil
	Salvador	100	27.4.40	c22,271	+ c3,971	44	c877,205	c917,089	– c39,884	Pr. Lt. Db.	19½	16	15	Nil
	San Paulo	153½	26.5.40	50,533	+ 10,514	21	775,775	650,678	+ 125,097	Ord. Stk.	38	20	31½	7½
	Taltal	160	Apl. 1940	3,085	+ 1,390	44	26,220	29,225	– 3,005	Ord. Sh.	⅝	6/6	⅝	7½
	United of Havana	1,353	1.6.40	20,355	+ 2,577	49	1,184,989	1,149,030	+ 35,959	Ord. Stk.	2	½	½	Nil
	Uruguay Northern	73	Apl. 1940	1,225	+ 492	44	11,226	9,837	+ 1,389	Deb. Stk.	2	2	2	Nil
Canada	Canadian National	23,695	31.5.40	1,303,475	+ 197,646	22	18,264,322	14,498,402	+ 3,765,920	—	—	—	—	—
	Canadian Northern ...	—	—	—	—	—	—	—	– 4 p.c.	Perp. Dbs.	74⅜	60	69⅛§	5¼
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	100⅛	76	99⅛	4
	Canadian Pacific	17,162	7.6.40	574,000	+ 95,600	23	12,812,800	10,769,200	+ 2,043,600	Ord. Stk.	7⅜	3½	5½	Nil
India †	Assam Bengal	1,329	30.4.40	45,187	+ 6,529	4	135,060	120,437	+ 14,623	Ord. Stk.	76½	60	74½	4
	Barsi Light	202	20.5.40	3,810	+ 638	7	21,030	16,267	+ 4,763	Ord. Sh.	56½	50¼	42½	8¼
	Bengal & North Western ...	2,096	20.5.40	94,418	+ 11,432	7	469,804	407,264	+ 62,540	Ord. Stk.	277	229½	267	6
	Bengal Doors & Extension ...	161	20.5.40	3,501	+ 962	7	18,661	12,662	+ 5,999	,,	91	84½	215	3
	Bengal-Nagpur	3,269	20.5.40	247,650	+ 17,103	7	1,252,050	1,161,007	+ 91,043	,,	94¾	83½	94	4½
	Bombay, Baroda & Cl. India	2,986	31.5.40	336,300	+ 36,525	9	1,816,575	1,641,450	+ 175,125	,,	108	90	106½	5⅛
	Madras & Southern Mahratta	2,967	20.5.40	189,225	+ 3,954	7	959,700	906,339	+ 53,361	,,	104½	92	99½	7 7/8
	Rohilkund & Kumaon ...	571	20.5.40	22,132	+ 5 636	7	110,568	83,572	+ 26,996	,,	280	263	277	5¾
	South Indian	2,531¼	20.5.40	121,425	+ 7,685	7	598,652	589,624	+ 9,028	,,	102½	88	88¼	5⅝
Various	Beira	204	Feb. 1940	66,949	—	26	425,917	—	—	—	—	—	—	—
	Egyptian Delta	623	10.5.40	4,591	– 602	6	19,436	20,384	– 948	Prf. Sh.	½	½	⅜	Nil
	Kenya & Uganda	1,625	—	—	—	—	—	—	—	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	55	39	49½	7 1/16
	Midland of W. Australia ...	277	Mar. 1940	12,505	– 4,071	40	115,376	138,753	– 23,377	Inc. Deb.	91½	87½	82½	4¾
	Nigerian	1,900	13.4.40	46,170	+ 14,163	2	102,860	62,791	+ 40,069	—	—	—	—	—
	Rhodesia	2,442½	Feb. 1940	355,386	—	26	2,242,412	—	—	—	—	—	—	—
	South Africa	13,288	18.5.40	641,880	+ 38,405	7	4,533,791	4,345,894	+ 187,897	—	—	—	—	—
	Victoria	4,774	Feb. 1940	872,466	+ 171,113	35	6,699,801	6,217,729	+ 482,072	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛
Argentine traffics are now given in pesos. † Receipts are calculated @ 1s. 6d. to the rupee § ex dividend